Food Allergy Update: What’s New in 2011

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New England Food Allergy Treatment Center
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Food Allergies: Epidemiology

- In children, prevalence of food allergy has increased by 18% (4 million school-aged kids)
- Peanut allergy in US has tripled (0.4% to 1.4%) from 1997 to 2008
- Food allergy is most common cause of anaphylaxis presenting to emergency depts.
- Hospitalizations increased 3-fold in past decade in US and UK
- 90% of food-induced anaphylaxis fatalities due to peanut/tree nuts
Hospital Discharges w/ DX of Food Allergy

**FIGURE 2**
Average numbers of hospital discharges per year with any diagnosis of food allergy, with and without food allergy-specific V codes, among children < 18 years of age in the United States in 1998–2006. The data were from the NHDS. *V codes for food allergy were introduced in 2000; therefore, no visits from 1998–2000 used food allergy V codes. 1 Overall trend statistically significant (z = 6.72; P < .0001); 2 trend among discharges with no food allergy V codes not statistically significant.
Adverse Reactions to Food

A. Non-immunologic

Toxic Reactions

- Bacterial food poisoning
- Scromboid fish poisoning
- Caffeine
- Alcohol
- Histamine

Non-Toxic Reactions

- Lactose Intolerance
- Galactosemia
- Pancreatic insufficiency
- Gustatory rhinitis
- Anorexia Nervosa
- Idiosyncratic
Adverse Reactions to Food

B. Immune Mechanisms-A Spectrum

IgE-Mediated ➔ Non-IgE Mediated

- Systemic (Anaphylaxis)
- Oral Allergy Syndrome
- Hives
- Immediate GI allergy

- Eosinophilic Esophagitis (EE) or Gastroenteritis (EG)
- Atopic dermatitis
- Protein-Induced Enterocolitis (FPIES)
- Celiac Disease
- Enteropathy
- Infant Proctocolitis
- Dermatitis Herpetiformis
Figure 1. The Mechanism of Sensitization and Allergic Reaction.
## IgE-Mediated Food Allergy Signs and Symptoms

<table>
<thead>
<tr>
<th>SKIN</th>
<th>GASTROINTESTINAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hives/angioedema</td>
<td>Itching or swelling of lips, tongue, mouth</td>
</tr>
<tr>
<td>Flushing</td>
<td>Nausea</td>
</tr>
<tr>
<td>Papular rash</td>
<td>Vomiting or reflux</td>
</tr>
<tr>
<td>Pruritis</td>
<td>Abdominal cramping (can be severe)</td>
</tr>
<tr>
<td></td>
<td>Diarrhea</td>
</tr>
</tbody>
</table>
IgE-Mediated Food Allergy
Signs and Symptoms

RESPIRATORY
- Congestion, itching, sneezing, runny nose
- Laryngeal edema, cough, hoarseness
- Wheezing, shortness of breath, chest tightness

CARDIOVASCULAR
- Feeling of faintness
- Syncope
- Tachycardia or bradycardia
- Hypotension/shock
- Arrhythmias
Food Anaphylaxis

• An acute systemic allergic reaction that is potentially fatal
• The opposite of prophylaxis “without or against protection”
• Onset of symptoms seconds to minutes (up to 2 hrs) following ingestion
• Prior reactions to the food may have been milder
• Very unpredictable in its clinical presentation and outcome
Patterns of Anaphylaxis

- **Uniphasic**
  - Rapid onset, symptoms resolve within hours of treatment

- **Biphasic**
  - Symptoms resolve after treatment but return between 1 and 72 hours later (usually 1-3 hours)

- **Protracted**
  - Symptoms do not resolve with treatment and may last >24 hours

Lieberman, 2004
Uniphasic Anaphylaxis

Antigen Exposure

Treatment

Initial Symptoms

0 Time

Antigen Exposure

Time
Biphasic Anaphylaxis

Antigen Exposure → Initial Symptoms (0-8 hours) → Treatment

Classic Model: 1-72 hours

Second-Phase Symptoms (1-72 hours) → Treatment

New Evidence: 1-72 hours

Time
Protracted Anaphylaxis

Initial Symptoms

Antigen Exposure

Possibly >24 hours

Time
Features of Fatal/Near Fatal Reactions in Children (Sampson et al, NEJM, 1992)

- Pts. knew they were allergic to causative food
- Did not ask about ingredients, were misinformed or incorrect labeling of product
- Injectable epinephrine (EpiPen) not carried or administered in a timely fashion
- Peanuts and tree nuts most common foods, but other foods (eg. milk)
- Patients had asthma even if it was well controlled
- Skin reactions (hives, swelling) were not present in most cases
Epinephrine

- Treats all symptoms of anaphylaxis and prevents progression
- Intramuscular injection in lateral thigh produces most rapid rise in blood level
  - 0.01 mg/kg in children, 0.3-0.5 mg in adults
- Patients who receive epinephrine and have symptoms other than hives should be lying down with feet elevated (empty heart syndrome)
- Up to 20% of time, more than one dose needed
- New recommendations: have 2 or more devices
IM vs SQ Epinephrine

Subcutaneous epinephrine

Intramuscular epinephrine (Epipen®)

Time to C_{max} after injection (minutes)

Simons: J Allergy Clin Immunol 113:838, 2004
Additional Treatment of Anaphylaxis

- Oxygen supplementation
- Fluid replacement (10-20 cc/kg)
- H-1 antagonists (eg. Diphenhydramine) and H-2 antagonists (eg. Ranitidine)
- Corticosteroids—but no proven benefit
- Severe cases: IV epinephrine, vasopressors
- Observe for 4-24 hrs after initial symptoms have subsided
Factors That Can Affect Allergenicity of Foods

- Preparation: Roasting vs. boiling of peanuts
- Chemical properties of food: Heat stable vs. heat labile proteins (the oral allergy syndrome)
- Gastric digestion: Can affect the allergenicity of some food proteins
- Medications: Beta blockers, ACE inhibitors increase anaphylaxis risk
- Alcohol consumption
Oral Allergy Syndrome (Pollen/Food Allergy Syndrome)

- Very common form of IgE-mediated food allergy
- Occur in 40%-50% of pollen allergic individuals
- Itching of lips, mouth, throat due to cross-reacting proteins in pollen and fruit
- Uncommon to progress to severe reactions but occasionally does occur (throat tightness and hoarseness are not *mild* symptoms)
- Treatment: Heating, peeling fruit or avoidance during pollen season, immunotherapy (allergy shots to related pollen) may lessen reactions
### Oral Allergy Syndrome

**Examples:**

<table>
<thead>
<tr>
<th>Pollen</th>
<th>Foods</th>
</tr>
</thead>
<tbody>
<tr>
<td>Birch</td>
<td>Apple, peach, cherry, kiwi, plum, hazelnut and almond</td>
</tr>
<tr>
<td>Ragweed</td>
<td>Banana, melon, watermelon</td>
</tr>
<tr>
<td>Grass</td>
<td>Carrot, celery, peach, potato, tomato</td>
</tr>
</tbody>
</table>
Food-dependent Exercise-induced Anaphylaxis

- Requires food ingestion followed by exercise to occur
- Anaphylaxis occurs when patient exercises within 2 to 4 hours of ingesting a food
- Can be a specific food (common examples: celery, shellfish, wheat) or could be ANY food
- Females>Males (2:1) more in teens, young adults
- Management: Identifying specific foods, if possible, avoiding exercise after eating, and carrying epinephrine during vigorous activity
Disorders Not Proven to be Related to Food Allergy

- Migraines
- Behavioral / Developmental disorders
- Arthritis
- Seizures
- Inflammatory bowel disease
Food Allergies in Schools

- Food reactions including anaphylaxis are not uncommon in schools.
- 16% of children with a food allergy will experience an allergic reaction in school.
- Almost 25% of Peanut/nut allergic reactions occurred in school/day care before a diagnosis was made.
- A survey of anaphylaxis in school showed epinephrine was necessary in many children without any prior experience of food allergy.
Inhalant Exposure/Casual Contact

- For peanut and peanut butter at room temp. there are *no* significant airborne levels of PN protein
- Allergic reactions to foods are *immunologic* responses to protein allergens
- Odors are *neurologic* responses triggered by volatile organic compounds
- 30 children w/ severe peanut allergy had an inhalation challenge, none had an reactions
- Also, after applying PN butter to the skin for 10 minutes there were no systemic reactions
Peanut Protein in Schools

• Soap and water removes peanut protein from hands and surfaces
• Similarly effective for table surfaces
• Hand sanitizers/dishwashing liquid alone do not remove peanut protein from a surface, they only move the protein around
• Airborne PN protein not found in the school air even when peanut butter was consumed in the school where the air was sampled
• Peanut protein relatively easy to clean with conventional cleaning methods
Should peanuts be banned in schools?

• No studies have been done on subject, open to best judgment
• Are peanut-free tables in schools really necessary? Perhaps with the youngest children
• Milk-resulted in more allergic reactions per capita than peanut or other nuts
• 79% of food reactions occurred in classroom, only 12% occurred in cafeteria
• Problem: Peanut butter containing projects such as bird-feeders
Preventing/treating food-induced reactions in schools

- Deficiencies exist nationally in protocols for managing food anaphylaxis
- Emergency Action Plans (EAPs) in place only 33% of cases
- During a reaction, plans when present, were frequently not followed
- In a survey of parents/school personnel, of the students who had food anaphylaxis 14% had no physician orders
Recognizing/treating reactions

- According to national peanut/tree nut registry, gaps in care exist in recognizing and treating anaphylaxis in schools
- In 32% cases of food anaphylaxis in schools, symptoms of an allergic reaction were not recognized
- Where trained personnel know what to do, there often were no trained back-up staff
- Only 26% with a history of an allergic reaction to a food had epinephrine available
Management in Schools

- Everyone makes mistakes
- Accidents are never planned
- All children must have a *food allergy treatment form* or EAP which reviews symptoms and treatment of anaphylaxis
- Review your emergency action plans regularly
- Educate others on what to do in case you need their help or are not available
CONNCTICUT ASTHMA & ALLERGY CENTER LLC
836 FARMINGTON AVENUE, SUITE 207, WEST HARTFORD, CT 06119-1351 • (800) 232-9911 • FAX: (860) 233-5996

Authorization for the Administration of Medicine by School personnel
Connecticut State Law and Regulations 10-212(a) require a written medication order from an authorized prescriber and parent/guardian written authorization, for the nurse, or in the absence of the nurse, a designated principal or teacher to administer medications.

Authorization for the Administration of Medicine by Child Day Care personnel must comply with Section 19a-79-9a (Group Day Care Homes and Child Day Care Centers) and Section 19a-82b-17 (Family Day Care Homes) of the Regulations for Connecticut State Agencies.

Authorization for the Administration of Medicine by Youth Camp personnel must comply with Section 19-13-827(a) of the Regulations for Connecticut State Agencies.

FOOD ALLERGY TREATMENT PLAN FOR SCHOOL, CHILD DAY CARE, YOUTH CAMP, AND FIELD TRIPS, AND PERMISSION FOR THE ADMINISTRATION OF MEDICATIONS BY SCHOOL PERSONNEL, CHILD DAY CARE PERSONNEL, AND/OR YOUTH CAMP PERSONNEL

PATIENT'S NAME: ____________________ DATE OF BIRTH: ________________
PATIENT'S ADDRESS: ____________________ TELEPHONE: ____________________
CAAC PHYSICIAN'S NAME: ____________________ PATIENT'S PCP: ____________________

ASTHMA ☐ YES ☐ NO FOOD ALLERGY ☐
IF PATIENT INGESTS OR THINKS HE/SHE HAS INGESTED THE ABOVE NAMED FOOD:

Anaphylaxis* can occur up to 2 hours following ingestion of a food allergen

☐ Administer adrenaline before symptoms occur, IM EpiPen Jr__ EpiPen Adult__ Twinject Jr__ Twinject Adult__
☐ Administer adrenaline if symptoms occur, IM EpiPen Jr__ EpiPen Adult__ Twinject Jr__ Twinject Adult__
☐ Administer Benadryl tsp/ tsp/ tsp/ tsp/ tsp/ Swallow
☐ Administer tsp/ tsp/ tsp/ tsp/ tsp/ Swallow

Call 911, transport to ER if symptoms occur for further evaluation, treatment, and observation X 4 hours

The severity of symptoms can quickly change. All symptoms of anaphylaxis can potentially progress to a life-threatening situation!

Physician’s Signature ____________________ Today's Date ________________

1. Is this a controlled drug? ☐ Yes ☐ No Time of administration: ________________
2. Medication shall be administered (if applicable) during school year ____________________ ____________________ (dates)
3. Relevant side effects, if any, to be observed: ____________________

SELF ADMINISTRATION OF MEDICATION AUTHORIZATION/APPROVAL

Self administration of medication may be authorized by the prescriber and parent/guardian and must be approved by the school nurse (if applicable) in accordance with Board policy.

Prescriber’s authorization for patient to carry/self-administer: ☐ Yes ☐ No Signature ________________ Date ________________

Parent’s authorization for patient to carry/self-administer: ☐ Yes ☐ No Signature ________________ Date ________________

School nurse approval (if applicable) for patient to carry/self-administer: ☐ Yes ☐ No Signature ________________ Date ________________

*SYMPTOMS OF ANAPHYLAXIS

Mouth: Itchy mouth, swelling of lips, tongue, inside of mouth
Skin: Hives, itchy skin, swelling about face, eyes
Gut: Nausea, vomiting, cramps, diarrhea
Throat: Itchy throat, tightness in throat, hoarseness, drooling, hacking cough
Lungs: Shortness of breath, wheezing, repetitive coughing, profuse runny nose
Heart: Lightheadedness, dizziness, passing out: Put feet above head when giving adrenaline

Renewal Date / / / / Initials ____________________

☐ I HAVE RECEIVED, REVIEWED, AND UNDERSTAND THE ABOVE INFORMATION
☐ I request that medication be administered to my child as described and directed above to be administered by school / child day care / youth camp staff

Patient/parent/guardian signature ____________________ Date Signed ________________
Relationship to Child ____________________
Address ____________________

CAAC/IPS/dmc Food Allergy Treatment Plan 12/08
High Risk Population: Adolescents

- More likely to eat meals and snacks outside the home
- More likely not to carry their epinephrine autoinjector on their person
- Take more chances with food...do not think about mortality
- Keep their food allergy issues to themselves
- Are afraid to use their epinephrine autoinjector—less empowered
Diagnosis: History / Physical

• History: symptoms, timing, reproducibility
  – Acute reactions vs chronic disease
• Diet details: specific causal food(s) or hidden ingredients
• Physical examination: look for other allergic conditions (eczema, asthma)
• Identify the type of reaction:
  – Is it food related at all?
  – Allergy or intolerance?
  – IgE type reaction or non-IgE type reaction?
Diagnosis: Laboratory Evaluation

• Suspect IgE-mediated (allergy)
  – Prick skin tests
  – ImmunoCAP /RAST test (IgE levels in blood)
• Suspect non-IgE-mediated
  – Allergic gastrointestinal conditions
    -- Elimination diets may be helpful
• Suspect not allergic, consider: lactose intolerance, toxic reactions, celiac disease (gluten-sensitivity)
Skin Testing

• Provide rapid screening for sensitivity to allergens
• Less discomfort and cost compared to blood tests
• Size of skin test may be helpful in predicting likelihood of reacting
• Negative skin tests strongly suggest the absence of IgE-mediated allergy
• May need to skin test with fresh foods
Blood Tests for Foods

• ImmunoCAP/RAST test measure specific IgE antibody levels to different foods in the blood

• Also helpful in predicting likelihood of an allergic reaction

• High levels less likely to outgrow allergy

• Newer blood tests (component diagnostics) should be able to predict the severity of an allergy (eg. peanut-Ara h 2 vs Ara h 8)
Limitations of Tests

• Blood test ‘screening’ not advised because may lead to unnecessary or harmful dietary restriction which can frustrate and confuse parents/patients

• Size of skin test and numerical value (ie. absolute # or level I-IV) of the blood test do not predict severity of the clinical reaction

• A blood test level of <0.35Ku/L is not necessarily negative, but rather the lowest level that the assay can measure

• Patients can have food reactions with levels of <0.35Ku/L

• So false positives and false negatives do occur and these tests must be looked upon in the context of the history
Increasing probability of clinical reactivity with increasing level of food-antigen specific IgE value; note: values <0.35 do not exclude allergic reactivity
Oral Food Challenges

- Identify what foods can be safely consumed when there are multiple positive skin or blood tests
- To introduce foods suspected of causing allergic reactions despite negative testing
- To monitor patients who have food allergies which are more likely to be outgrown
- Performed under close supervision with emergency medications and equipment immediately available to manage reactions
Why is there more food allergy?

• Genetics: peanut allergy 7x greater in sibs of high risk children, 64% in identical twins

• *Earlier* exposure of peanut in childhood may associated w/ *lower* prevalence of PN allergy

• Vitamin D *deficiency*: Lower levels due to less sunlight may be responsible for increase in allergy in temperate areas (evidence: more epi pens written for in northeast US than in south, more eczema too)

• Hygiene hypothesis: Birth by CS associated with increase risk of food allergy (bacterial exposure during vaginal delivery may be protective)
Consequences of A Food Allergy Diagnosis

- Special precautions required at home, schools, restaurants, friends/relatives, on vacations, etc.
- The need for stringent dietary restrictions
- Difficulty comprehending food labels
- The continual threat of accidental ingestions
- The risk of severe or fatal reactions
- Significant anxiety, psychosocial stress, and economic burden
- Reduced health-related quality of life
Standard of Care for Food Allergy

• Every food allergic reaction has possibility of developing into life-threatening reaction

• May depend upon how much of the food is eaten, other ‘co-factors’

• Long-standing principle of complete avoidance of even minute exposures and ready access to self-injectable epinephrine.
Natural History of Food Allergy

- Most children with food allergies will eventually tolerate milk, egg & wheat
- Time onset of resolution varies by food and may occur as late as teenage years
- Elevated initial allergen specific IgE is associated with lower rate of resolution
- Resolution of atopic dermatitis may be a useful marker for food allergy tolerance
- Skin tests to food can remain positive after tolerance has developed, but a decrease in size may be indicator of loss of allergy
Does strict avoidance speed resolution?

- For years, recommendation was that strict avoidance was best for tolerance to develop
- Principle that lack of exposure will result in deletion of immunologic memory
- Many children do outgrow food allergy when instructed to avoid exposure
- The concern that accidental ingestions can delay /prevent tolerance development
- Maybe this is wrong approach......
Does avoidance trigger increased reactivity?

- 7 children who tolerated fish but were instructed to avoid based on positive skin tests. After 2 years of avoidance/reintroduction induced acute reactions in all 7 children.
- Case report of teenage girl who died from milk protein anaphylaxis due to loss of tolerance from milk avoidance diet.
- Late onset peanut allergy developing in adults who were told to avoid based on positive tests.
- Peanut recurrence rate ~8%. Seems to affects patients who avoid peanut after resolution of allergy.
Recent data has challenged the long-standing idea of strict avoidance, instead, attempting to incorporate small amounts of the food into the diet.
BAKED GOODS
Changing from Avoidance to Limited Diet

• 70% of children with egg allergy and 75% of children with milk allergy tolerate these foods in baked goods

• Recent studies show ability to eat foods with heated milk/ baked in egg are good prognostic indicators of tolerance

• Regular ingestion associated with decrease skin test size

• Studies ongoing: Does this regular ingestion accelerate tolerance development?
Effect of Cooking & Digestion on Food Proteins

Children who “outgrow” milk or allergy will often tolerate baked-milk or baked-egg products.
Interventional Approaches: The Treatment of Food Allergies

• I Allergen non-specific treatment
  1) Anti-IgE therapy (an injection every few weeks of a monoclonal AB which binds to and blocks IgE)
  2) Chinese Herbs (inhibits food anaphylaxis in mice, studies in humans)

• II Allergen-specific treatment (directed at individual foods)
  1) Oral immunotherapy (OIT)
  2) Sublingual immunotherapy (SLIT)
  3) Engineered ‘recombinant’ proteins
Historical Case

• 1908 – “A Case of Egg Poisoning” – Schofield described case of 13 y/o boy who had severe egg allergy; treated w/ daily pill containing raw egg starting w/ 1/10,000th of an egg; 8 months later, could eat whole egg

• First case reports of oral desensitization appeared ~20 years ago.
Allergen Specific Oral Immunotherapy Studies

• Ongoing studies at multiple centers with children allergic to peanut, egg or milk
• Giving gradually increasing amounts of protein over the course of weeks/months until desensitized
• Low risk of systemic reactions reported - studies need to be done in specialized facility using proper protocols and safety precautions
• Efficacy shown in desensitizing children with food allergies
• At the very least….Protection if accidental ingestion occurs from allergic reactions!
Fig. 1 The numbers of published papers on immunotherapy or oral tolerance for food allergy. The numbers of published papers found by searching PubMed with keywords of “food allergy & immunotherapy” or “food allergy & oral tolerance” since 1990 are shown. †Searched on September 1, 2009.
Peanut Allergy

- Only about 15-20% will outgrow peanut allergy
- Accidental exposures are common—incidence of 33% per year
- Diagnosis has significant adverse effects on quality of life
- Allergic reactions are becoming more severe: ER visits and hospitalizations are increasing
- Currently can’t reliably predict severity using skin and blood tests
- Oral immunotherapy to peanut has been performed successfully in clinical research settings
ORAL DESSENSITIZE

Desensitization – change in threshold dose of food needed to cause an allergic reaction while on ongoing therapy

TO INDUCE

ORAL TOLERANCE.

Tolerance – resolution of allergy without ongoing treatment
Case Report of Peanut Oral Desensitization

• 2006 – Letter to Editor:
  6 y/o girl with severe peanut allergy, RAST >100 IU underwent oral desensitization;
  Goal: to ensure that child would not have reaction to unintentional modest exposures not to make her eat peanuts as a normal food
  Final dosing was 2 whole peanuts twice daily

Peanut OIT

- 4 severely peanut allergic boys, aged 9-13 y/o, underwent oral immunotherapy (OIT)
- OIT was administered as peanut flour from 5 to 800 mg (1/2 tsp peanut butter)
- Challenges done in medical facility; doses were taken at home once daily x 2 weeks; Doses doubled at each step
- Continued on 800 mg for additional 6 weeks; 3 tolerated 12 peanuts, 1 tolerated 9 peanuts
- After final challenge, subjects continued to take 1/2 tsp peanut butter or 5 peanuts as maintenance

Peanut Oral Immunotherapy – Duke / Univ of Arkansas

• Largest multi-center group studying children with peanut allergies
• 29 children <16 y/o w/ peanut allergy
• Protocol: 3-phases: initial dose escalation day, buildup phase, home dosing phase followed by oral food challenges
• Goal: Daily maintenance dose of 300 mg of peanut protein ~1-2 peanuts

Initial Escalation Day

• IV inserted in all pts.
• Started with 0.1 mg of peanut protein, double dose every 30 minutes until 50 mg of peanut ingested;
• Cumulative dose = 99 mg
• Return next day for observed ingestion of maximum tolerated dose
Buildup and Home Dosing Phase

- Patient ingested daily dose for a minimum of 2 weeks;
- If tolerated, subject underwent an observed dosage escalation where daily dose was increased by 25 mg every 2 weeks until 300 mg dose was reached (1/4 tsp peanut butter);
- 300 mg dose was ingested daily for a period of up to 24 months.
Peanut OIT resulted in clinical desensitization

- Oral food challenges with peanut were conducted in all 29 patients after they were on OIT for 12-24 months
- Consisted of 4 dose – 300 mg, 600 mg, 1200 mg and 1800 mg given every 30 minutes – Total dose = 3.9 grams of peanut protein ~16 peanuts
- 27/29 children reached the total peanut dose; 1 stopped due to parent anxiety and other due to hives/vomiting

New England Food Allergy Treatment Center (NEFATC)

- Clinical center for designed for oral immunotherapy to foods
- Follow protocols previously established as safe and effective
- Goals:
  1. Clinical desensitization to foods
  2. Substantially improve quality of life, measuring with validated surveys, and using data to improve knowledge in field of food allergy
- Obtained IRB (Institutional Review Board) approval, legitimizes our investigations with safety as a priority
- Hope to study milk and egg, other foods in the near future
Peanut OIT Protocol at NEFATC

- Similar to Duke Study with dose escalation, build-up, home maintenance phases
- Initial day, 5-6 hours, IV for access if necessary: 0.1 mg (<1/1000 of peanut) increased every ½ hour to 6 mg dose
- Return every 2 weeks (1 ½-2 hr visit) for build-up dose
- Dosage goal = 383 mg/day of peanut (2-3 peanuts)
- Time to reach maximum dose approximately 5-6 months, depending on patient/symptoms
Experience to Date: NEFATC

- 50 Patients have been enrolled
- Ages 5-20 yrs
- Serum IgE levels >100 kU/L in 20 patients
- Several patients have reached maintenance dose of consuming 2-3 peanuts/day
- Very infrequent symptoms observed during initial day
- Symptoms observed mostly abdominal upset usually mild, at lowest doses and relieved by reducing the dose then building up slower
- Often relieved/prevented by taking dose on full stomach
- No severe reactions (or need to date for epinephrine)
Peanut Oral Immunotherapy
Generally Safe but not w/o Risk

• Should be performed in a facility designed primarily for these procedures
• Trained staff (one to one) with keen knowledge of food allergies and management of reactions
• Equipment, emergency medications and procedures in place
• Utilize experience of others to assist in developing similar and safer protocols
<table>
<thead>
<tr>
<th>TABLE II. Recommendations for future oral immunotherapy investigations</th>
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<tbody>
<tr>
<td>Hold daily dose if febrile or ill with symptoms of viral illness</td>
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<tr>
<td>(eg, upper respiratory tract infection, gastroenteritis).</td>
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<tr>
<td>Resume dosing at home if &lt;3 missed daily doses.</td>
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<tr>
<td>Return to research unit for observed dose if 3-5 missed daily doses.</td>
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<tr>
<td>Consider repeat desensitization or significant dose reduction if &gt;5 missed daily doses.</td>
</tr>
<tr>
<td>Closely monitor lower and upper respiratory symptoms.</td>
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<tr>
<td>Initiate asthma controller medication if needed.</td>
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<tr>
<td>Perform peak flow and spirometric monitoring.</td>
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<tr>
<td>Ensure optimal control of allergic rhinitis.</td>
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<tr>
<td>Take daily OIT dose with meal or snack</td>
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<tr>
<td>In subjects with exercise-induced symptoms, limit exertion for 2 hours after dosing.</td>
</tr>
<tr>
<td>Closely monitor during menstrual cycle, especially when coupled with infection or exercise.</td>
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</tbody>
</table>
Unanswered Questions

• What is the optimal dose?
• Ideal duration of OIT
• Degree of protection provided
• Factors leading to inducing tolerance (cure)
• Efficacy for different ages, severity and type of food allergy
• NEFATC experience: Low risk of reactions but explanation why GI symptoms most common and what we can do to reduce them
Is oral immunotherapy a reasonable treatment option?

- Benefit in psychosocial impact due to food allergy on patients and families (Examining validated food allergy QOL surveys)
- Even with strict avoidance: allergic reactions due to accidental exposure to peanut not uncommon
- High morbidity associated with peanut allergy
- Patients are very motivated to come in for visits and maintain daily treatment
- Potential for tolerance induction (cure) in some
Important caveats for treatment

• Not ready for at general allergy office and never tried at home
• Highly controlled setting: dedicated research facility devoted to administration of OIT
• Protocols used (Duke/U Arkansas) have been established and published in peer reviewed journals
• Oversight by IRB
• Safety: one on one nursing, direct physician oversight, preparation of dosing by trained dietitian
• Home dosing: Following recommended guidelines regarding manner/timing of doses, illnesses, medical conditions, missed doses
• Long-term effects: Unknown, but no untoward events or complications in peanut studies
What the experts think…

• “When performed by experienced investigators in an appropriate setting, peanut OIT is a safe, allergen-specific therapy effective in inducing desensitization and providing protection against accidental ingestion with ongoing therapy”

Conclusions

• Prevalence of food allergy has increased in recent years to peanut and other foods
• More severe reactions/anaphylaxis observed
• Understanding anaphylaxis and optimal treatment can be improved
• Recognizing risks at schools: separating fact from fiction
• Effective therapies for food allergy are becoming available and are now being actively studied locally and elsewhere
Referral for Food Allergy Evaluation

- History of severe reactions to any food
- Atopic dermatitis that may be food related
- Allergy to peanut, tree nuts, fish, shellfish
- Unexplained episode(s) of anaphylaxis
- Clarifying status of food allergic patient
- The patient with multiple food allergies for nutritional guidance
- Oral immunotherapy?
References

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"It's not you—it's my anaphylaxis."
Getting more information

- Speak to parents/patients who are going thru the process at this time (we can help facilitate)
- Call NEFATC-talk to staff and physicians about the treatment (860) 986-6099
- See website: www.nefoodallergy.org
- Visit our Center: 836 Farmington Avenue, Suite 138, West Hartford, CT
- Review the literature from Duke/Univ. of Arkansas: Oral immunotherapy to peanut (W Burks, S Jones)