Please Pass the Peanut Butter: Nutrition Strategies to Prevent and Manage Food Allergies

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Disclosure

Tonya Krueger and Child Health Specialty Clinics do not have any affiliations with any persons or entities that could be perceived as having a bearing on her presentation.
Objectives

• Recognize emerging food allergies and related conditions
• Demonstrate familiarity with current trends and research in food allergies
• Follow guidelines for introducing new foods in relation to food allergy risk
• Identify patients at risk for nutritional deficiencies caused by food restriction
Outline

• Provide background information on food allergies and related conditions
• Review changes in food allergy prevalence and guidelines over past 20 years
• Discuss current guidelines for introducing new foods with regards to food allergies
• Address specific nutrition concerns and strategies to manage common food allergies in the 0-5 population
Food Allergies

What is a food allergy?
- Exposure to protein that triggers a harmful immune response
- IgE and non IgE mediated

Allergic reactions:
- Mild to moderate- itchy mouth, a few hives, not life threatening
- Severe- throat tightening, difficulty breathing, anaphylactic shock, can be life-threatening
Non IgE Mediated Allergies

**FPIES** - Food Protein-Induced Enterocolitis Syndrome
- Vomiting or diarrhea about 2 hours after consuming allergen

**EOE** - Eosinophilic Esophagitis
- Enflamed esophagus can make swallowing difficult and painful

**Allergic Proctocolitis**
- An allergy to formula or breast milk inflames the lower part of the intestine
Oral Allergy Syndrome

IgE mediated reaction to allergens found in both pollen and raw fruits, vegetables, or some tree nuts

- Birch pollen: apple, almond, carrot, celery, cherry, hazelnut, kiwi, peach, pear, plum
- Grass pollen: celery, melons, oranges, peaches, tomato
- Ragweed pollen: banana, cucumber, melons, sunflower seeds, zucchini

Symptoms

- Itchy mouth, scratchy throat, or swelling of the lips, mouth, tongue, and throat, can progress to systemic symptoms (9%) and anaphylactic shock (1.4%)

Food Intolerance

Symptoms may be similar to food allergies but do not involve IgE antibodies

- **Lactose Intolerance** - difficulty digesting lactose, due to limited production of lactase

- **Celiac Disease** - gluten intolerance, autoimmune condition that can impact multiple areas, including the skin and digestive system
Food Sensitivities

General term that includes conditions that are not specific allergies or intolerances, symptoms vary, are inconsistent and may be difficult to diagnose.

- **Gluten Sensitivity** - symptoms may range from fatigue to digestive issues, may be dose dependent

- **IBS** - Irritable Bowel Syndrome, digestive issue, symptoms may improve with implementation of FODMAP diet (link to handout):
  - [https://www.nestlehealthscience.us/asset-library/documents/lowfodmap/1.3_lowfodmapcentral.pdf](https://www.nestlehealthscience.us/asset-library/documents/lowfodmap/1.3_lowfodmapcentral.pdf)

- **Sulfite Sensitivity** - ingestion of sulfites that causes asthmatic reaction in certain individuals
<table>
<thead>
<tr>
<th>Comparison of Similar Conditions</th>
<th>Allergies</th>
<th>Oral Allergy Syndrome</th>
<th>Intolerance</th>
<th>“Sensitivities”</th>
</tr>
</thead>
<tbody>
<tr>
<td>System</td>
<td>Immune</td>
<td>Immune</td>
<td>Digestive</td>
<td>Both</td>
</tr>
<tr>
<td>Response Time</td>
<td>Immediate</td>
<td>Immediate</td>
<td>Varies</td>
<td>Delayed</td>
</tr>
<tr>
<td>Quantity</td>
<td>Any amount</td>
<td>Varies</td>
<td>Varies by Dose</td>
<td>Varies</td>
</tr>
<tr>
<td>Reaction</td>
<td>Itching, hives, stomach cramps, vomiting, diarrhea, swelling, anaphylaxis</td>
<td>Itchy mouth, scratchy throat, itchy ears, swelling of the lips, mouth, tongue, and throat</td>
<td>Nausea, stomach pains, bloating, vomiting, diarrhea</td>
<td>Nausea, stomach pains, vomiting, bloating, diarrhea, headache, irritability, joint pain, eczema, lack of energy</td>
</tr>
<tr>
<td>Reproducible</td>
<td>Consistent</td>
<td>Processed form may be tolerated</td>
<td>Consistent given same circumstances</td>
<td>Inconsistent</td>
</tr>
<tr>
<td>Validated Diagnostic Tests</td>
<td>Skin prick; double-blind, placebo-controlled food challenge</td>
<td>None</td>
<td>Hydrogen breath test; biopsy</td>
<td>None</td>
</tr>
</tbody>
</table>

Chart adapted from Food & Nutrition Magazine, July/August 2017
Food Allergies in Children

Facts and Statistics

• Between 1997-1999 and 2009-2011, food allergy prevalence among children increased by 50%.

• 8% of children in the U.S. have a food allergy
  o 30% of children diagnosed with a food allergy have more than one food allergy
  o Children with food allergy are more 2 times as likely to have asthma and more than 3 times as likely to have respiratory allergy or eczema, compared to children without food allergies.
  o 40% of children diagnosed with food allergies have experienced anaphylaxis

Food Allergies in Children

Most common allergens:

- Peanut - 25.2%
- Milk - 21.1%
- Shellfish - 17.2%
- Tree nut - 13.1%
- Egg - 9.8%
- Fin fish - 6.2%
- Wheat - 5.0%
- Soy - 4.6%
- Sesame allergy is an emerging concern

Prevalence of Food Allergies in Children

Peanut Allergies

Increased Prevalence

• In 1999 peanut allergy affected 0.4% of children
• In 2010 peanut allergy affected 2% of children
• Leading cause of death related to food induced anaphylaxis in the U.S.

Prevention

• Improve public health
• Lower anxiety/fear of peanuts
• Decrease health care costs

History of Food Allergy Recommendations

Pre-2000’s
No concrete recommendations on avoidance of food allergens.
Food allergies began emerging and research began examining how to prevent childhood food allergies.

2000
AAP recommends delayed introduction of allergens for high risk infants.
No cow’s milk until age 1, no eggs until age 2, no peanuts, tree nuts and fish until age 3.
Mothers advised to avoid allergens during pregnancy and lactation.

2008
AAP report states no evidence to support the recommendations of avoidance of allergens until certain ages to help prevent childhood food allergies.
No active guidelines about how to introduce common allergens.

2010
NIAID Guidelines for the diagnosis and management of food allergy in the United State were published.
Guidelines suggest not delaying introduction of allergenic foods.

Food Allergy Guidelines

2014 EAACI Food Allergy and Anaphylaxis Guidelines for primary prevention of food allergy

Pregnancy:
No need to avoid foods containing the top allergens; eat variety of foods

0-4 months:
Main source of nutrition is breastmilk or formula, no baby foods given

4-6 months:
May start introducing baby foods containing one allergen

Complementary Feeding: A Position Paper by the European Society for Paediatric Gastroenterology, Hepatology, and Nutrition (ESPGHAN) Committee on Nutrition by Fewtrell, January 2017 includes details regarding milk and gluten

Observational Study

- Study published in 2008 found prevalence of peanut allergy 10-fold higher among Jewish children in the United Kingdom compared with Israeli children of similar ancestry.

- Peanuts introduced at about 7 months in Israel

- Peanuts introduced after 1 year of age in UK

- Can early consumption of allergens actually prevent food allergies?

Du Toit, George et al. Early consumption of peanuts in infancy is associated with a low prevalence of peanut allergy. Journal of Allergy and Clinical Immunology, Volume 122, Issue 5, 984 - 991
LEAP trial

Randomized trial, 640 children between 4-11 months of age with severe eczema, egg allergy or both

- Excluded infants with presumed peanut allergy
- 2 cohorts within each treatment group, avoidance or consumption, given oral food challenge at 60 months

Additional Studies

**LEAP-On Study 2016**

http://www.leapstudy.co.uk/leap-study-results-0#.WjgZflWnG M8

- Follow-up to LEAP trial, 1 year of peanut avoidance for all children, those in the consumption group still had protective effect even after avoiding peanuts for 1 year

**Enquiring About Tolerance study 2016**


- Results suggest early introduction of allergenic food may contribute to reduced rates of food allergies in children

**2017 Addendum to the 2010 “Guidelines for the Diagnosis and Management of Food Allergy”**
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2017 Addendum to 2010 NIAID Guidelines recommends early introduction of peanuts to prevent peanut allergy

Current Food Allergy Prevention Guidelines

Infants NOT at High Risk include:

• Infants of parents with food allergies
• Infants who have siblings with food allergies (including peanut)
• Infants with any other food allergy except egg

## Current Food Allergy Prevention Guidelines

<table>
<thead>
<tr>
<th>Symptoms for corresponding guideline</th>
<th>Recommendation for Introducing Peanuts</th>
<th>Earliest age of peanut introduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>No eczema or any food allergy</td>
<td>No special considerations</td>
<td>Developmentally appropriate; in keeping with family/cultural preferences</td>
</tr>
<tr>
<td>Mild-to-moderate eczema</td>
<td>No special considerations</td>
<td>Around 6 months</td>
</tr>
</tbody>
</table>

*Togias, Alkis et al. Addendum guidelines for the prevention of peanut allergy in the United States: Report of the National Institute of Allergy and Infectious Diseases–sponsored expert panel. Annals of Allergy, Asthma & Immunology, Volume 118, Issue 2, 166 - 173.e7*
Introducing peanuts to children not at risk at home:

- Total amount of peanut protein to be regularly consumed per week should be approximately 6-7 g over 3 or more feedings.

- 2 grams peanut protein serving:
  - 21 Bambas; dissolve with 4-6 tsp of water if needed.
  - 2 tsp of peanut butter thinned with 2-3 tsp of hot water, can mix into previously accepted infant cereal or infant puree.
  - 2 tsp of peanut butter powder or flour mixed with 2 TBSP infant puree.
  - 10 whole peanuts ground and thinned with water.
  - [https://www.youtube.com/watch?v=q8fLUN1ZfXs](https://www.youtube.com/watch?v=q8fLUN1ZfXs)

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<th>Recommendation for Introducing Peanuts</th>
<th>Earliest age of peanut introduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Severe eczema; known egg allergy; both</td>
<td>Consider evaluation with sIgE and/or SPT. If necessary, an OFC. Based on results, introduce peanut products</td>
<td>4-6 months “to reduce the risk of peanut allergy”</td>
</tr>
</tbody>
</table>

Severe eczema
or
Egg allergy
or
Both

Peanut sIgE*

<0.35
Risk of reaction low. Over 90% will have (-) SPT to peanut.
Options:
a) Introduce peanut at home
b) Supervised feeding in the office
(based on provider/parental preference)

≥0.35
Refer to specialist for consultation/SPT protocol

Peanut Skin Prick Test

0-2 mm
Risk of reaction low (95% will not have peanut allergy).
Options:
a) Introduce peanut at home
b) Supervised feeding in the office
(based on provider/parental preference)

3-7 mm
Risk of reaction varies from moderate to high.
Options:
a) Supervised feeding in office
b) Graded OFC in a specialized facility

≥8 mm
Infant probably allergic to peanut.
Continue evaluation and management by a specialist

* To minimize a delay in peanut introduction for children who may test negative, testing for peanut-specific sIgE may be the preferred initial approach in certain health care 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.

Food Allergy & Adequate Nutrition

Nutrition Concerns

• Restricted diets increase risk for nutritional deficiency by 25%
• Risk for nutritional deficiency increases with each additional food allergy
• Peanut allergy alone is not at high risk for nutrient deficiency due to nutritionally complete alternative foods
• Milk and egg allergies impact more nutrients
Food allergy in addition to certain conditions or circumstances also increases risk for inadequate nutrient intake:

- Picky eating
- Feeding problems
- Developmental delays
- Limited resources or access to food/food insecurity
- Medical conditions that require increased calories
# Nutrients

<table>
<thead>
<tr>
<th>Milk</th>
<th>Peanut/Tree nut</th>
</tr>
</thead>
</table>
| - Protein, Carbohydrate and Fat (unless skim)  
- Calcium, Phosphorus  
- Vitamins A, D, B12 and riboflavin (B2) | - Protein, Fat, Fiber  
- Vitamin E, Folic Acid, Niacin, Biotin  
- Copper, Magnesium, Manganese, Chromium |

<table>
<thead>
<tr>
<th>Egg</th>
<th>Fish/Shellfish</th>
</tr>
</thead>
</table>
| - Protein, Fat  
- Iron  
- Vitamins A, D, E, B12, Riboflavin (B2), Folacin, Biotin | - Protein, Omega-3 fatty acids  
- Vitamin A, E, B6, niacin, folic acid  
- Phosphorus, Potassium Selenium, Copper, Zinc |
Protein & Calorie Intake

Food group targets for a 1,200 calorie* pattern are:

### Fruits
1 cup of fruits counts as:
- 1 cup raw or cooked fruit; or
- 1/2 cup dried fruit; or
- 1 cup 100% fruit juice.

### Vegetables
1 1/2 cups
1 cup vegetables counts as:
- 1 cup raw or cooked vegetables; or
- 2 cups leafy salad greens; or
- 1 cup 100% vegetable juice.

### Grains
4 ounce equivalents
1 ounce of grains counts as:
- 1 slice bread; or
- 1 ounce ready-to-eat cereal; or
- 1/2 cup cooked rice, pasta, or cereal.

### Protein
3 ounce equivalents
1 ounce of protein counts as:
- 1 ounce lean meat, poultry, or seafood; or
- 1 egg; or
- 1 Tbsp peanut butter; or
- 1/4 cup cooked beans or peas; or
- 1/2 ounce nuts or seeds.

### Dairy
2 1/2 cups
1 cup of dairy counts as:
- 1 cup milk; or
- 1 cup yogurt; or
- 1 cup fortified soy beverage; or
- 11/2 ounces natural cheese or 2 ounces processed cheese.

### Food & Nutritional Information

<table>
<thead>
<tr>
<th>Food</th>
<th>Protein</th>
<th>Calories</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 cup of 2% milk</td>
<td>8 g</td>
<td>120</td>
</tr>
<tr>
<td>1 egg</td>
<td>7 g</td>
<td>75</td>
</tr>
<tr>
<td>1 oz string cheese</td>
<td>6 g</td>
<td>80</td>
</tr>
<tr>
<td>5.3 oz Chobani yogurt</td>
<td>12 g</td>
<td>130</td>
</tr>
<tr>
<td>1 Tbsp peanut butter</td>
<td>4 g</td>
<td>94</td>
</tr>
</tbody>
</table>

# Micronutrients

<table>
<thead>
<tr>
<th>Calcium</th>
<th>Vitamin D</th>
<th>Vitamin E</th>
<th>Riboflavin (B2)</th>
<th>Niacin (B3)</th>
<th>B12</th>
</tr>
</thead>
<tbody>
<tr>
<td>Milk</td>
<td>Salmon</td>
<td>Fortified cereal</td>
<td>Fortified cereal</td>
<td>Fortified cereal</td>
<td>Clams</td>
</tr>
<tr>
<td>Yogurt</td>
<td>Tuna</td>
<td>Sunflower seeds</td>
<td>Milk</td>
<td>Poultry</td>
<td>Fortified cereal</td>
</tr>
<tr>
<td>Fortified drinks</td>
<td>Shrimp</td>
<td>Nuts</td>
<td>Yogurt</td>
<td>Tuna</td>
<td>Trout, salmon</td>
</tr>
<tr>
<td>Cheese</td>
<td>Tofu</td>
<td>Plant-based Oils</td>
<td>Clams</td>
<td>White rice</td>
<td>Beef</td>
</tr>
<tr>
<td>Salmon</td>
<td>Milk</td>
<td>Green leafy veggies</td>
<td>Cottage Cheese</td>
<td>Mushrooms</td>
<td>Yogurt</td>
</tr>
<tr>
<td>Tofu</td>
<td>Fortified drinks</td>
<td>Tomatoes</td>
<td>Green leafy veggies</td>
<td>Beef</td>
<td>Tuna</td>
</tr>
<tr>
<td>Beans</td>
<td>Fortified cereal</td>
<td>Peanuts</td>
<td>Pork</td>
<td>Ham</td>
<td>Milk</td>
</tr>
<tr>
<td>Nuts &amp; Seeds</td>
<td>Eggs</td>
<td>Eggs</td>
<td>Beans</td>
<td>Pork</td>
<td></td>
</tr>
<tr>
<td>Green leafy veggies</td>
<td>Hamburger</td>
<td>Peanuts</td>
<td>Eggs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Broccoli</td>
<td>Chicken</td>
<td>Shrimp</td>
<td>Cheese</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Milk Allergy

General Information

• Approximately 2.5 percent of children younger than three years of age are allergic to milk.
• Nearly all infants who develop an allergy to milk do so in their first year of life.
• Most children eventually outgrow a milk allergy.
• Milk protein allergy is often confused with lactose intolerance.
• Dairy products provide protein, calcium, phosphorus, vitamins A, D, B12 and riboflavin.
Milk Allergy

Nutrition Recommendations

• Infant formula or milk
  o Increased incidence of soy allergy
  o Consider hydrolyzed protein or amino acid based formula

• Milk alternatives
  o Choose non-dairy milk with 5 grams protein per cup
  o Choose fortified non-dairy milk
  o Soy milk appropriate over 1 year of age

• Consider a multivitamin with iron
  o Needed if not drinking complete formula
  o Difficult for children to consume calcium and vitamin D from other foods
Nutrition Services

Role of a Registered Dietitian in Managing Food Allergies

• Nutrition assessment
  o Evaluate intake
  o Review growth and weight

• Nutrition recommendations
  o Alternative foods and products
  o Multivitamin and mineral supplements

• Nutrition education
  o Reading food labels
  o Planning meals
  o Eating away from home
Child Health Specialty Clinics

**Telehealth Nutrition Visits**
- Early ACCESS nutrition services
  - children ages 0-3 eligible for early intervention services
- 1st Five nutrition services
  - children ages 0-5 referred by primary care provider

**Curbside Consultation**
- Stephany Brimeyer MPH, RD, LD
- CHSC Nutrition Services Manager
  - 563-344-2253
  - stephany-brimeyer@uiowa.edu
Allergy Resources

Food Allergy Resource and Education
• https://www.foodallergy.org/
  o Information about living with food allergies, programs and research

Kids With Food Allergies
• http://www.kidswithfoodallergies.org/page/welcome.aspx
  o General information and support for individuals with new food allergies
• http://www.kidswithfoodallergies.org/page/recipes-diet.aspx
  o Allergen free recipes for families organized in searchable database

Full text link to 2017 NIAID Allergy Guidelines
• http://www.annallergy.org/article/S1081-1206%2816%2931164-4/fulltext#appsec6

Full text link to 2017 Complementary Feeding: A Position Paper by ESPGHAN) Committee on Nutrition
Allergy Resources

Allergy Resources


Background

Peanut allergy tends to begin early in life and persist through adulthood. Allergic reactions to peanut can range from mild to severe and even life-threatening. To avoid these reactions, people with peanut allergy must be vigilant about the foods they eat and the environments they enter, which can be extremely stressful for them and for their families.

New Clinical Trial Results on Peanut Allergy Prevention

Recent scientific research has shown that peanut allergy can be prevented by introducing peanut-containing foods into the diet early in life. Researchers conducted a clinical trial called Learning Early About Peanut Allergy (LEAP) with more than 600 infants considered to be at high risk of developing peanut allergy because they had severe eczema, egg allergy, or both. The scientists randomly divided the babies into two groups. One group was given peanut-containing foods to eat regularly, and the other group was told to avoid peanut-containing foods. They did this until they reached 5 years of age. By comparing the two groups, researchers found that regular consumption of peanut-containing foods beginning early in life reduced the risk of developing peanut allergy by 81 percent.
Preventing Allergies: What You Should Know About Your Baby’s Nutrition

Any baby can develop an allergy. It has long been known that allergies tend to run in families. If one or both parents or other siblings have an allergic disease, your infant is more likely to develop an allergic condition, such as food allergy or atopic dermatitis (eczema). Your feeding choices can also make a difference in your baby’s likelihood of developing allergies, and your child’s nutrition can play a critical role in prevention. Note: The following recommendations for your baby’s nutrition and prevention of allergies are not intended for infants who have already developed an allergic condition.

Introducing Solid Foods to Your Baby

Experts recommend exclusive breastfeeding until 4 to 6 months of age. The timing of introducing solid foods depends on your baby’s developmental readiness. When your baby is able to sit up and has sufficient head and neck control, then he or she may be ready for solid foods. Timing of certain foods should also be considered when introducing solid foods to your baby.

You can introduce solid foods when your baby is between 4 and 6 months of age and developmentally able to sit with support with sufficient head and neck control.

Single ingredient infant foods, such as rice or oat cereal, yellow and orange vegetables (sweet potato, squash and carrot), fruits (apples, pears and bananas), green vegetables, and then age-appropriate stage-based foods with meats can be introduced to your baby one at a time, every 3 to 5 days. This slow process can give you the chance to identify and eliminate any food that may cause an allergic reaction.

You do not need to avoid acidic foods for your baby (acidic foods include berries, tomatoes, citrus fruits and vegetables) that may cause a rash around the mouth. This is due to irritation from the acid in the food, not from an allergic reaction to the food.

Introducing Highly Allergenic Solid Foods

In the past, some experts recommended that dairy products and other highly allergenic foods like eggs, peanuts and fish not be introduced until after an infant’s first birthday. More recently, evidence has shown that there is no reason to delay introduction of the highly allergenic foods beyond 4 to 6 months of age. In fact, delaying the introduction of these foods may increase your baby’s risk of developing allergies.

Highly allergenic foods can be introduced to your baby between 4 and 6 months of age, just as you would introduce any other solid foods. Highly allergenic foods that you can feed your baby include dairy products such as cheese, yogurt or cow’s milk protein formula (not whole cow’s milk to drink due to nutrition reasons not related to allergies); egg; soy; wheat; peanut; and tree nuts in a form of batter or paste (not whole peanuts or tree nuts due to aspiration risk); and fish and shellfish.

You may want to be cautious when introducing your baby to highly allergenic solid foods. One safe way to do this is to introduce the first tastes at home rather than at day care or a restaurant.

You should introduce highly allergenic foods to your baby after other solid foods have been fed and tolerated, and with the first taste being at home. If no reaction occurs, then you can gradually increase the amount at a rate of one new food every 3 to 5 days.

You should talk to your baby’s doctor before introducing a highly allergenic food for the following reasons if your infant has had an allergic reaction to a food or has a known food allergy, or you think your infant has a food allergy; your infant has persistent, moderate to severe atopic dermatitis despite recommended treatment; your infant’s sibling has a peanut allergy; or your infant has positive blood tests to food(s).

Your doctor may refer you an allergist/immunologist for evaluation and the development of a personalized plan to introduce solid foods to your infant.
Questions and Discussion

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