

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

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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

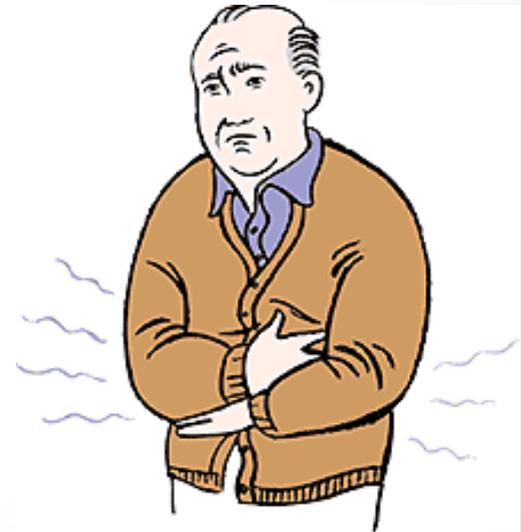
Symptoms

- 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
- **Sulfite Sensitivity**- ingestion of sulfites that causes asthmatic reaction in certain individuals

Comparison of Similar Conditions	Allergies	Oral Allergy Syndrome	Intolerance	"Sensitivities"
System	Immune	Immune	Digestive	Both
Response Time	Immediate	Immediate	Varies	Delayed
Quantity	Any amount	Varies	Varies by Dose	Varies
Reaction	Itching, hives, stomach cramps, vomiting, diarrhea, swelling, anaphylaxis	Itchy mouth, scratchy throat, itchy ears, swelling of the lips, mouth, tongue, and throat	Nausea, stomach pains, bloating, vomiting, diarrhea	Nausea, stomach pains, vomiting, bloating, diarrhea, headache, irritability, joint pain, eczema, lack of energy
Reproducible	Consistent	Processed form may be tolerated	Consistent given same circumstances	Inconsistent
Validated Diagnostic Tests	Skin prick; double-blind, placebo-controlled food challenge	None	Hydrogen breath test; biopsy	None

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

- Oral Allergy Syndrome <http://acaai.org/allergies/types/food-allergies/types-food-allergy/oral-allergy-syndrome>

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
 - **30%** of children diagnosed with a food allergy have more than one food allergy
 - 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.
 - **40%** of children diagnosed with food allergies have experienced anaphylaxis

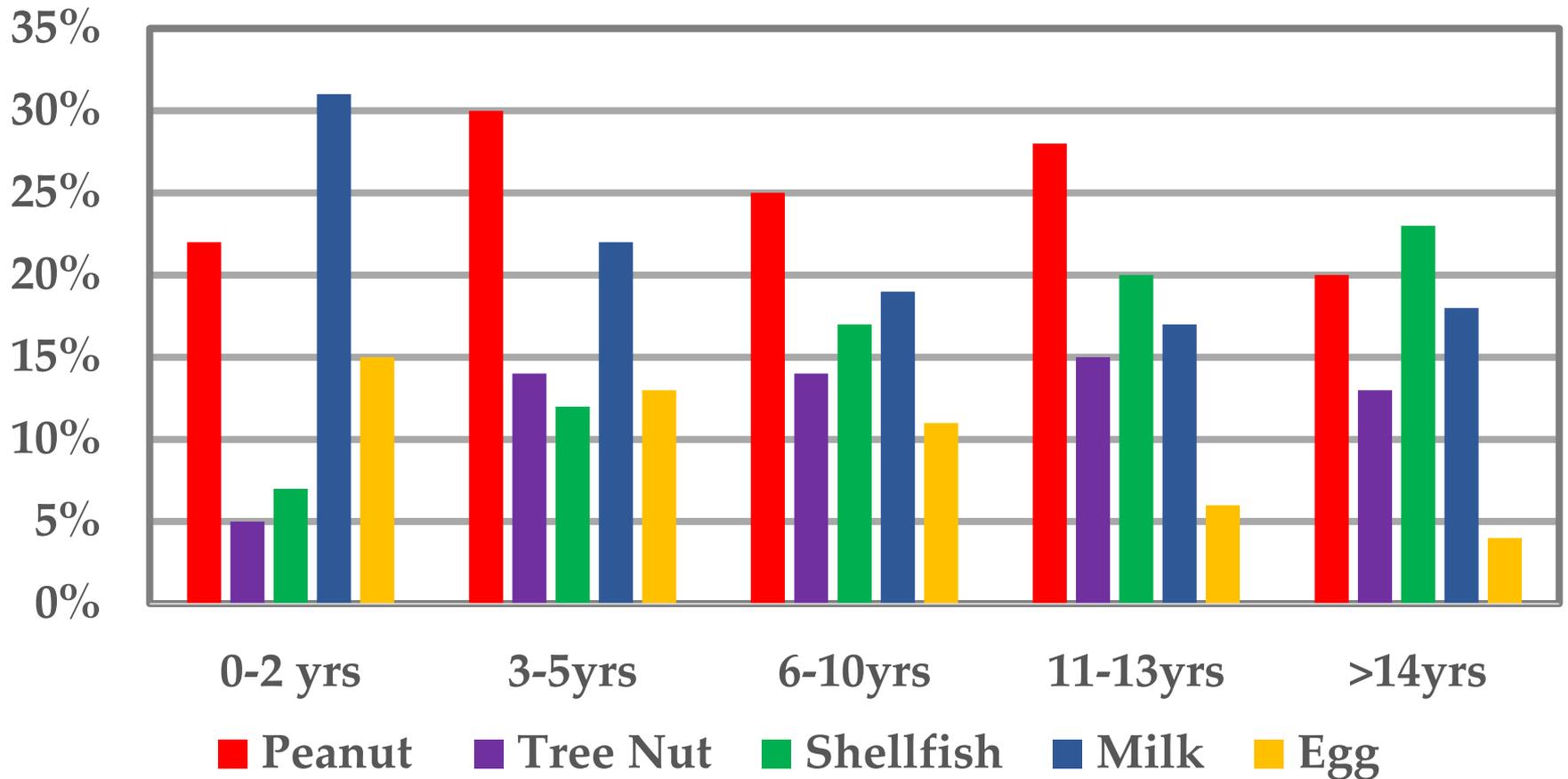
Food Allergies in Children

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



"Is it wrong to find contentment in peanut butter when others are allergic to it?"

Increased Prevalence

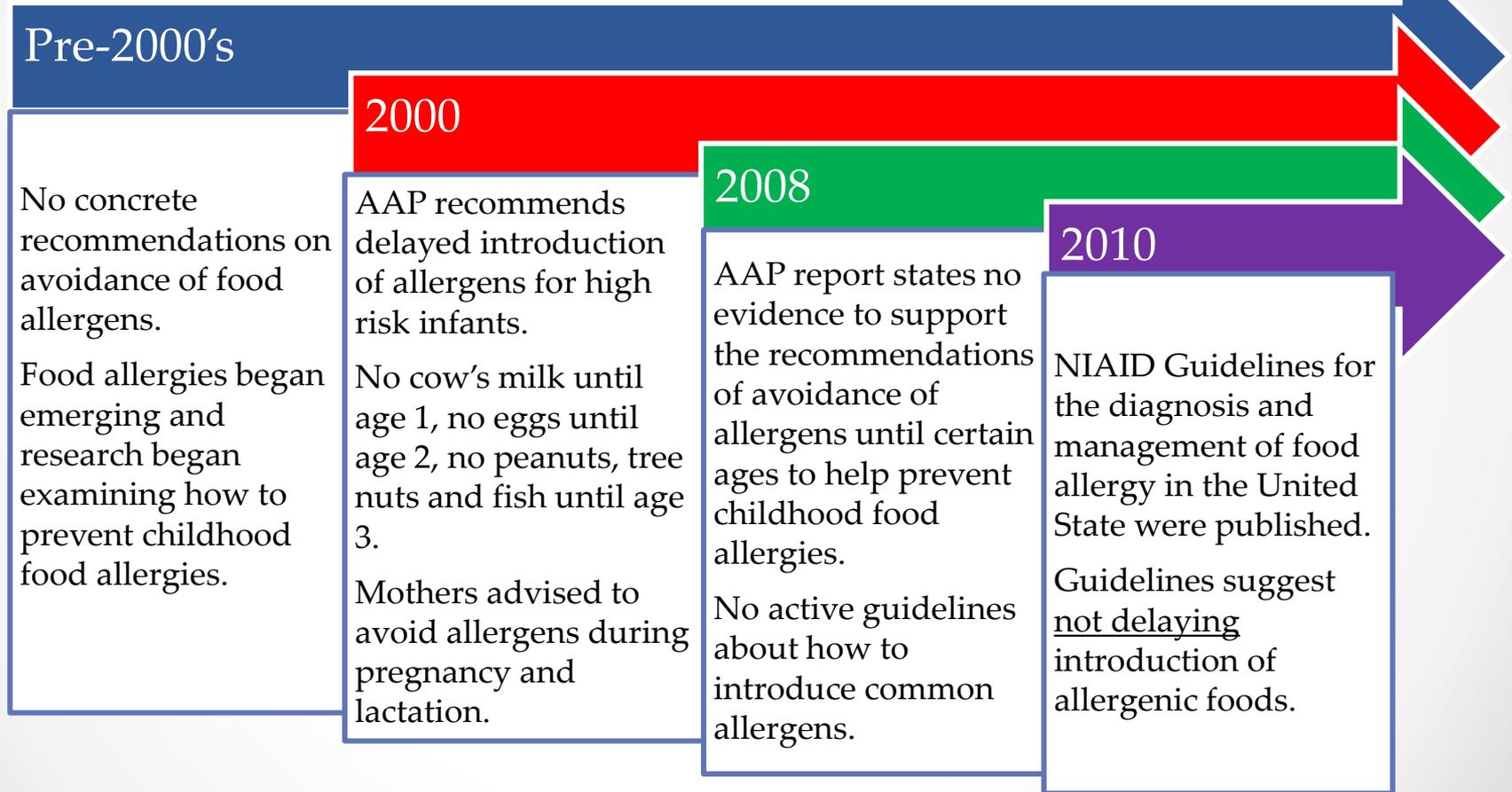
- In 1999 peanut allergy affected 0.4% of children
- In 2010 peanut allergy affected 2% of children
- Leading cause of death related to food induced anaphylaxis in the U.S.

Prevention

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

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

History of Food Allergy Recommendations



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

- EAACI Food Allergy and Anaphylaxis Guidelines Group. EAACI food allergy and anaphylaxis guidelines: diagnosis and management of food allergy. *Allergy*. 2014 Aug;69(8):1008-25. ●

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?



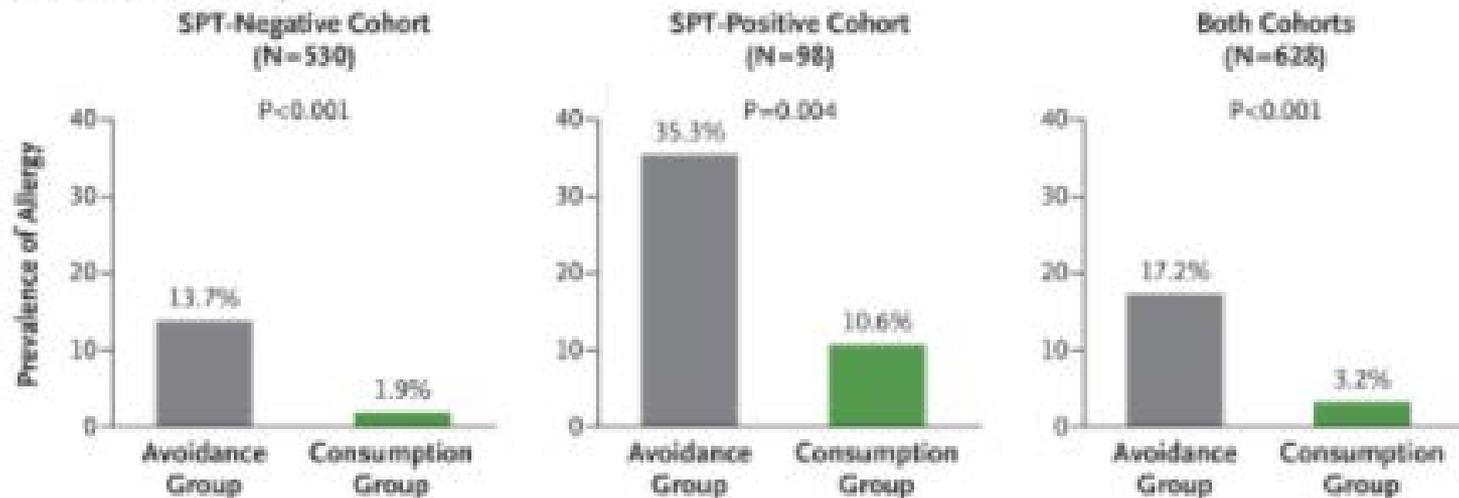
Du Toit, George et al. Early consumption of peanuts in infancy is associated with a low prevalence of peanut allergy. *Journal of Allergy and Clinical Immunology*, Volume 122, Issue 5, 984 - 991

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

A Intention-to-Treat Analysis



Additional Studies

LEAP-On Study 2016

<http://www.leapstudy.co.uk/leap-study-results-0#.WjgZflWnGM8>

- 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

<https://www.food.gov.uk/sites/default/files/eat-study-final-report-summary.pdf>

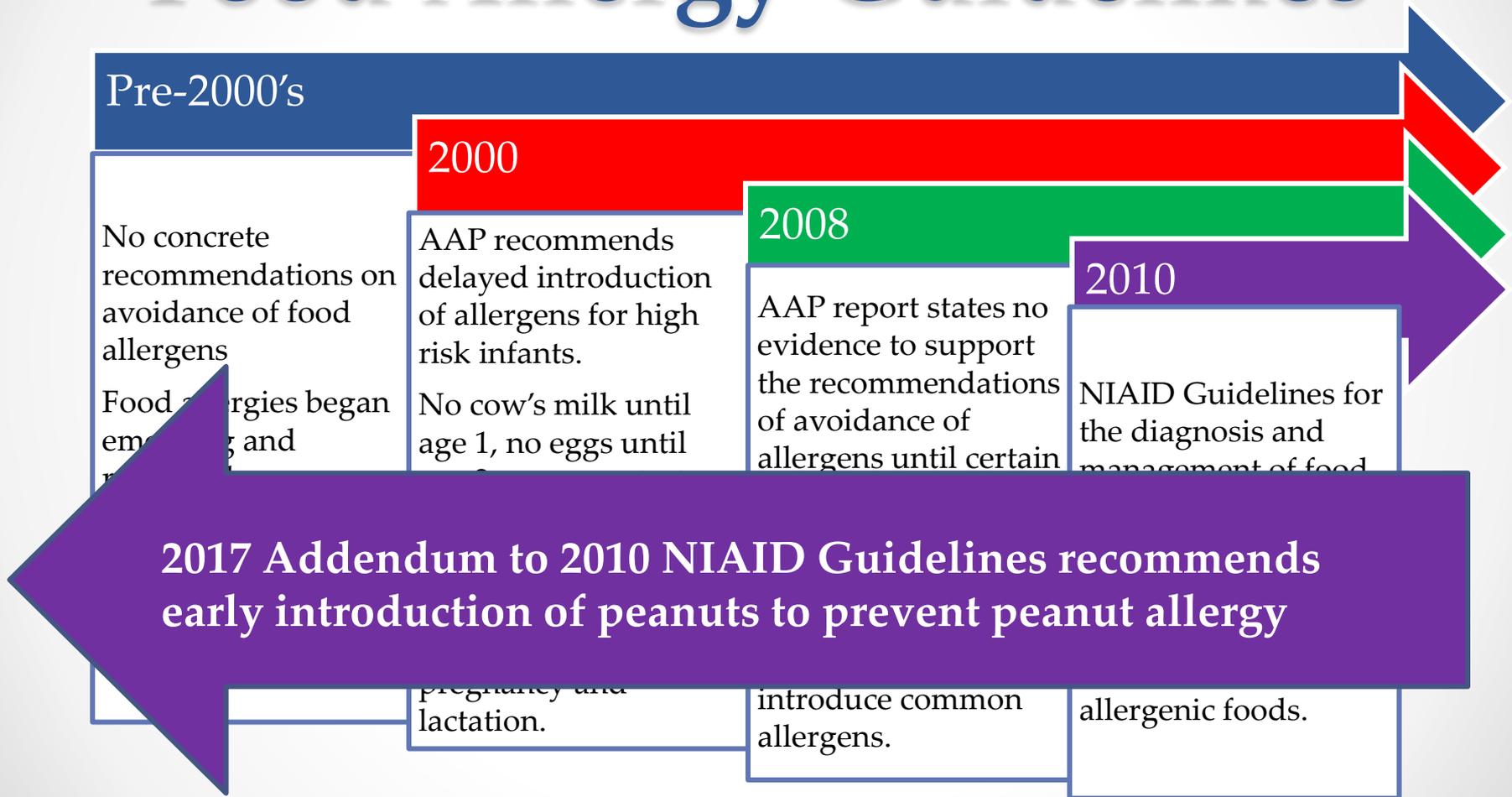
- Results suggest early introduction of allergenic food may contribute to reduced rates of food allergies in children

2017 Addendum to the 2010 “Guidelines

for the Diagnosis and Management of Food Allergy”



Food Allergy Guidelines



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

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

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

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

Current Food Allergy Prevention Guidelines

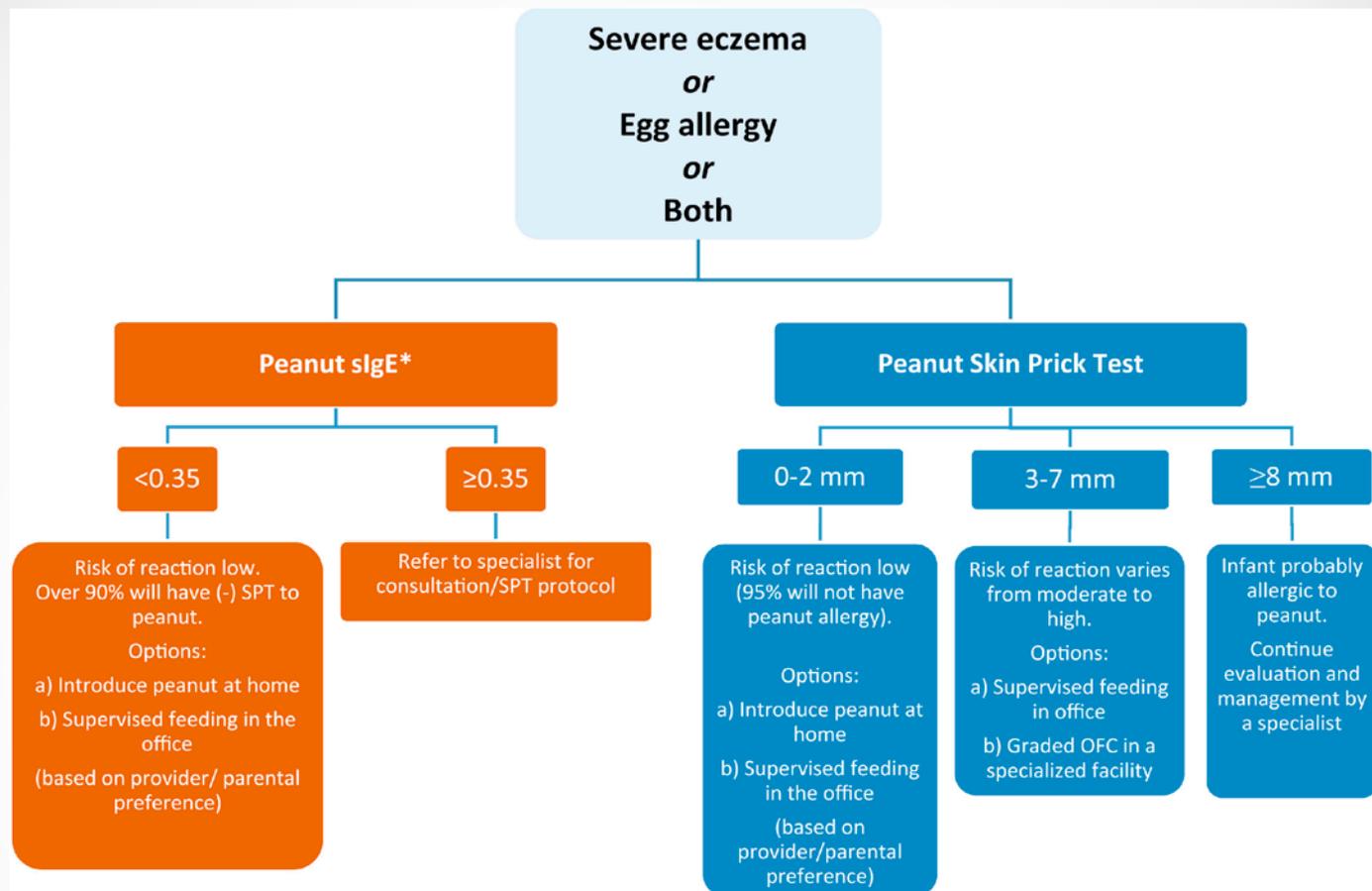
Introducing peanuts to children not at risk at home:

- 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>

Current Food Allergy Prevention Guidelines

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

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



* To minimize a delay in peanut introduction for children who may test negative, testing for peanut-specific IgE 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 & Adequate Nutrition

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

Milk

- Protein, Carbohydrate and Fat (unless skim)
- Calcium, Phosphorus
- Vitamins A, D, B12 and riboflavin (B2)

Peanut/Tree nut

- Protein, Fat, Fiber
- Vitamin E, Folic Acid, Niacin, Biotin
- Copper, Magnesium, Manganese, Chromium

Egg

- Protein, Fat
- Iron
- Vitamins A, D, E, B12, Riboflavin (B2), Folacin, Biotin

Fish/Shellfish

- 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:

 <p>Fruits</p>	<p>1 cup</p> <p>1 cup of fruits counts as</p> <ul style="list-style-type: none"> • 1 cup raw or cooked fruit; or • 1/2 cup dried fruit; or • 1 cup 100% fruit juice.
 <p>Vegetables</p>	<p>1 1/2 cups</p> <p>1 cup vegetables counts as</p> <ul style="list-style-type: none"> • 1 cup raw or cooked vegetables; or • 2 cups leafy salad greens; or • 1 cup 100% vegetable juice.
 <p>Grains</p>	<p>4 ounce equivalents</p> <p>1 ounce of grains counts as</p> <ul style="list-style-type: none"> • 1 slice bread; or • 1 ounce ready-to-eat cereal; or • 1/2 cup cooked rice, pasta, or cereal.
 <p>Protein</p>	<p>3 ounce equivalents</p> <p>1 ounce of protein counts as</p> <ul style="list-style-type: none"> • 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.
 <p>Dairy</p>	<p>2 1/2 cups</p> <p>1 cup of dairy counts as</p> <ul style="list-style-type: none"> • 1 cup milk; or • 1 cup yogurt; or • 1 cup fortified soy beverage; or • 1 1/2 ounces natural cheese or 2 ounces processed cheese.

Food	Protein	Calories
1 cup of 2% milk	8 g	120
1 egg	7 g	75
1 oz string cheese	6 g	80
5.3 oz Chobani yogurt	12 g	130
1 Tbsp peanut butter	4 g	94

https://choosemyplate-prod.azureedge.net/sites/default/files/myplate/checklists/MyPlateDailyChecklist_1200cals_Age2-3.pdf

Micronutrients

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

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
 - Increased incidence of soy allergy
 - Consider hydrolyzed protein or amino acid based formula
- Milk alternatives
 - Choose non-dairy milk with 5 grams protein per cup
 - Choose fortified non-dairy milk
 - Soy milk appropriate over 1 year of age
- Consider a multivitamin with iron
 - Needed if not drinking complete formula
 - 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
 - Evaluate intake
 - Review growth and weight
- Nutrition recommendations
 - Alternative foods and products
 - Multivitamin and mineral supplements
- Nutrition education
 - Reading food labels
 - Planning meals
 - Eating away from home

Nutrition Facts	
Serving Size 8 fl. oz. (240 mL)	
Servings per container 4	
Amount Per Serving	
Calories 70	Calories from Fat 35
% Daily Value*	
Total Fat 4g	6%
Saturated Fat 0.5g	3%
Trans Fat 0g	
Cholesterol 0mg	0%
Sodium 115mg	5%
Potassium 410mg	12%
Total Carbohydrate 9g	3%
Dietary Fiber 1g	4%
Sugars 7g	
Protein 1g	
Vitamin A 10%	Vitamin C 0%
Calcium 30%	Iron 2%
Vitamin D 25%	Vitamin E 50%
Folic Acid 20%	Phosphorus 60%
Magnesium 6%	
*Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs:	
	Calories 2,000 2,500
Total Fat	Less than 65g 80g
Saturated Fat	Less than 20g 25g
Cholesterol	Less than 300mg 300mg
Sodium	Less than 2,400mg 2,400mg
Potassium	3,500mg 3,500mg
Total Carbohydrate	300g 375g
Dietary Fiber	25g 30g
Calories per gram:	
Fat 9	Carbohydrate 4 • Protein 4



Ingredients:
 Filtered Water, Organic Evaporated Cane Juice, Sunflower Kernels, Sunflower Lecithin, Tricalcium Phosphate, Organic Tapioca Starch, Expeller Pressed Sunflower Oil, Sea Salt, Xanthan Gum, Guar Gum, Natural Flavor, Carrageenan, Vitamin A Palmitate, Vitamin D2, Folic Acid, d-Alpha Tocopheryl Acetate (Natural Vitamin E).

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/>
 - Information about living with food allergies, programs and research

Kids With Food Allergies

- <http://www.kidswithfoodallergies.org/page/welcome.aspx>
 - General information and support for individuals with new food allergies
- <http://www.kidswithfoodallergies.org/page/recipes-diet.aspx>
 - 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>

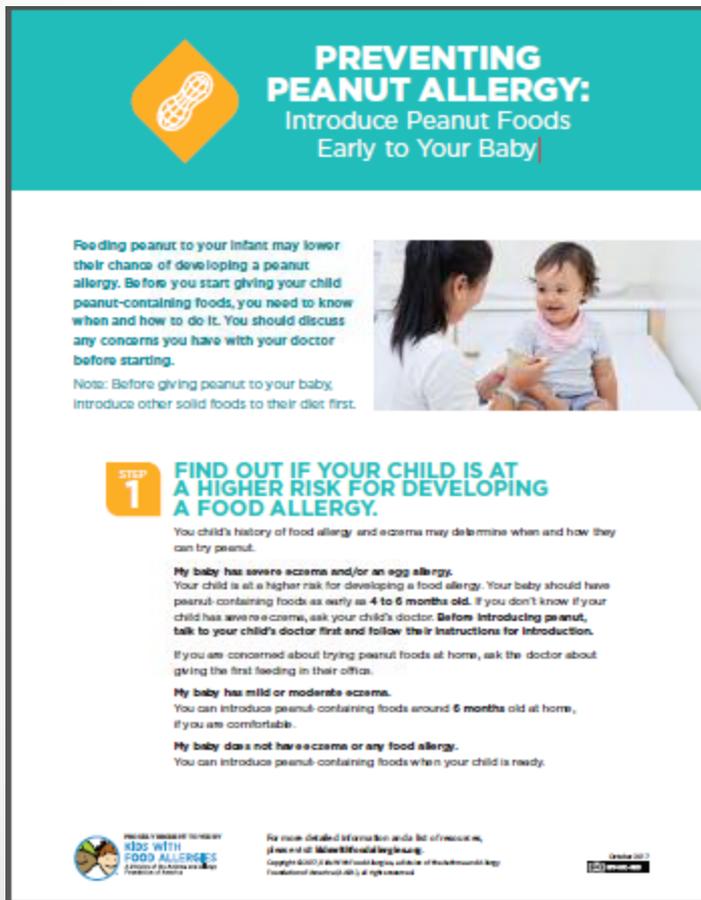
Full text link to 2017 Complementary Feeding: A Position Paper by (ESPGHAN) Committee on Nutrition

- https://journals.lww.com/jpgn/Fulltext/2017/01000/Complementary_Feeding_A_Position_Paper_by_the.21.aspx



Allergy Resources

<http://www.kidswithfoodallergies.org/page/physicians-health-care-providers.aspx>



PREVENTING PEANUT ALLERGY:
Introduce Peanut Foods Early to Your Baby

Feeding peanut to your infant may lower their chance of developing a peanut allergy. Before you start giving your child peanut-containing foods, you need to know when and how to do it. You should discuss any concerns you have with your doctor before starting.

Note: Before giving peanut to your baby, introduce other solid foods to their diet first.



STEP 1 FIND OUT IF YOUR CHILD IS AT A HIGHER RISK FOR DEVELOPING A FOOD ALLERGY.

Your child's history of food allergy and eczema may determine when and how they can try peanut.

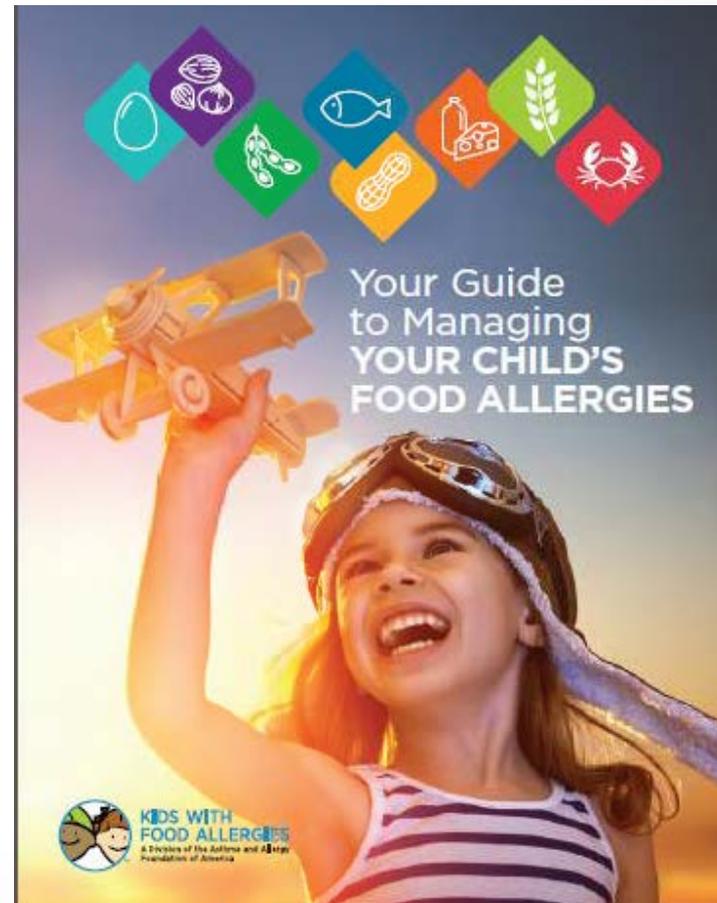
My baby has severe eczema and/or an egg allergy.
Your child is at a higher risk for developing a food allergy. Your baby should have peanut-containing foods as early as **4 to 6 months old**. If you don't know if your child has severe eczema, ask your child's doctor. **Before introducing peanut, talk to your child's doctor first and follow their instructions for introduction.**

If you are concerned about trying peanut foods at home, ask the doctor about giving the first feeding in their office.

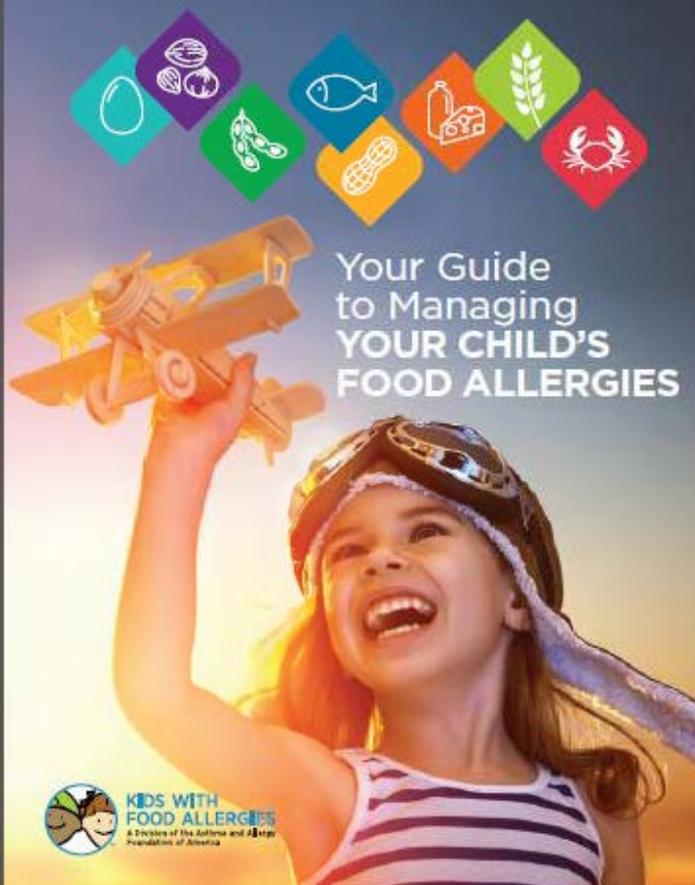
My baby has mild or moderate eczema.
You can introduce peanut-containing foods around **6 months old** at home, if you are comfortable.

My baby does not have eczema or any food allergy.
You can introduce peanut-containing foods when your child is ready.

Member of the National Food Allergy Initiative
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Your Guide to Managing
YOUR CHILD'S FOOD ALLERGIES



KIDS WITH FOOD ALLERGIES
A Division of the Asthma and Allergy Foundation of America

Allergy Resources

<https://www.niaid.nih.gov/sites/default/files/peanut-allergy-prevention-guidelines-parent-summary.pdf>

National Institute of Allergy and Infectious Diseases | health information

Addendum Guidelines for the Prevention of Peanut Allergy in the United States

Summary for Parents and Caregivers

NIAID

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.



A mother feeding her infant.

Allergy Resources

<http://www.kidswithfoodallergies.org/page/introducing-solids-infants.aspx>

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 carrots), 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 butter or paste (not whole peanuts or tree nuts due to aspiration risk); and fish and shellfish.

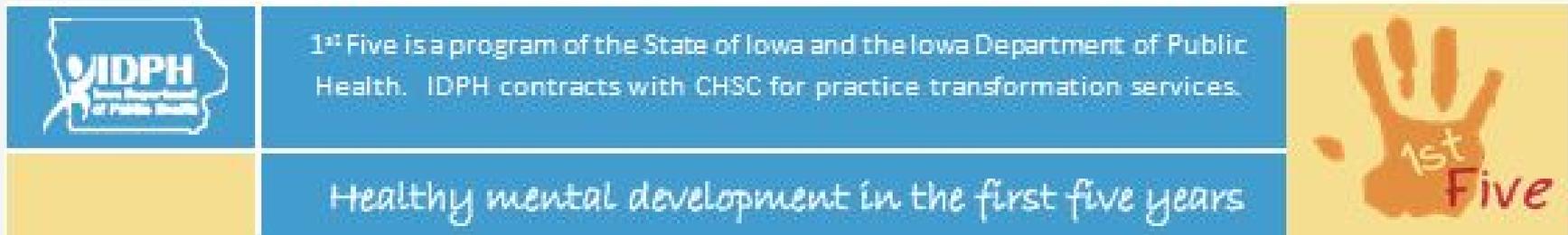
You may want to be cautious when introducing your baby to highly allergenic solid foods. One safe way to do this is to introduce the first tastes at home rather than at day care or a restaurant.

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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