



Practice Guidelines for Peanut Allergies

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ABSTRACT

This article reviews the latest recommendations and clinical practice guidelines for peanut allergies among the pediatric population. Recommendations in this paper were compiled using information collected from a variety of publications of accredited professional organizations. Peanut allergies are the body's response to what it sees to be an unwanted substance in the body. This article focuses on the causes, signs and symptoms, prevention, diagnosis, and management of peanut allergies. *J Pediatr Health Care.* (2018) 32, 98-102.

KEY WORDS

Anaphylaxis, immunotherapy, peanut allergy, pediatrics

OBJECTIVES

1. To learn the causes of peanut allergies.
2. To learn to identify and diagnosis peanut allergies.
3. To learn how to manage peanut allergies.
4. To learn how to prevent peanut allergies.

BACKGROUND

Peanut allergies are one of the most common food allergies among children, affecting up to 3% of children and persisting into adulthood in up to 80% of cases (Du Toit et al., 2015). Not only is peanut allergy common, it is one of the most dangerous allergies because of the potential for anaphylaxis. Peanut

allergies are the body's immune response to what it considers a foreign, unwelcome substance. The 2010 and 2015 *Guidelines for the Prevention of Peanut Allergies in the United States* offered no recommendations for allergy prevention because of lack of supporting evidence (Togias et al., 2017). Therefore, families were instructed to recognize symptoms and carry injectable epinephrine at all times to treat a severe reaction. Because of the potentially fatal response to peanuts, affected children and their parents quickly learned to live life diligently checking labels and being on alert for potential triggers.

ENCOURAGING NEW RESEARCH

Updated recommendations include data from a clinical study known as the Learning Early About Peanut (i.e., LEAP) trial (Du Toit et al., 2015), which evaluated the effects of early introduction of allergens as a means of prevention. The study randomized potential peanut-sensitive 4- to 11-month-old infants, based on a history of eczema, egg allergy, or both, into two groups. One group received standard-of-care peanut avoidance until 2 years of age, whereas the experimental group received an early introduction to peanuts. By 60 months of age, the peanut avoidance group had a prevalence of allergic symptoms of 13.7%, whereas the early introduction group had a prevalence of allergic symptoms of 1.9%. Thus, the National Institute of Allergy and Infectious Diseases guidelines now recommend early introduction of peanut products as early as 4 months, with the hope of reducing the prevalence of peanut allergies. Although most research is performed using peanut powders, parents are taught to begin introduction of age-appropriate peanut-containing foods starting between

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4 and 6 months of age, most commonly recommending peanut butter (Togias et al., 2017).

HISTORY AND SYMPTOMS

Assess for Risk Factors (Mayo Clinic Staff, 2015)

- Age of the child
 - Peanut allergies are most common in infants and toddlers because of their immature digestive systems.
- Other allergies
 - Children with other food or environmental allergies are at an increased risk for peanut allergies.
- Eczema history
 - A link between atopic dermatitis and food allergies is often noted.
- Family history
 - Children with close family members who have a history of food (particularly peanut or egg) allergies are at increased risk for a peanut allergy.

To assist in the diagnosis of a peanut allergy, the primary care provider should assess the following (American College of Asthma and Immunology, 2014):

- When was the first time the parent/caregiver noticed any reaction?
- What and how much did the patient eat?
- How soon after he/she ate did the symptoms begin?
- Have they noticed the symptoms worsening since the first reaction, or have the symptoms remained about the same?
- What did they do to help with the symptoms?
- Does anything make the symptoms worse?
- How long did it take the symptoms to resolve?

Although most allergic reactions to peanuts are mild in nature, anaphylaxis is possible. It is essential to teach parents to recognize symptoms of a reaction. Reactions usually occur very quickly after a substance is ingested. Mild to moderate reactions may present as follows (Boyce et al., 2010):

- Hives
- A runny nose
- Itchy, watery eyes
- Blotchy skin around the mouth
- Nausea, vomiting, diarrhea, and/or cramping
- Wheezing, coughing, and/or sneezing
- Gagging and/or choking

Anaphylaxis often presents differently and with much greater severity. If a child is having an anaphylactic reaction, expect to see the following (Sicherer et al., 2017):

- Difficulty breathing/wheezing/stridor
- Tingling around the mouth
- Throat, tongue, or uvula swelling/tightening
- Difficulty swallowing
- Loss of consciousness
- Pallor or flushing
- Crampy abdominal pain or vomiting
- Sudden onset of generalized itching

EVALUATION

Physical Examination (Boyce et al., 2010; Sicherer et al., 2017)

- Respiratory
 - Wheezing
 - Stridor
 - Cough
 - Dyspnea
 - Rhinorrhea
- Gastrointestinal
 - Abdominal pain
- Cardiovascular
 - Hypotension (Sicherer et al., 2017)
 - For infants and children
 - Based on age-specific guidelines, a low systolic blood pressure (BP)
 - More than 30% drop in systolic BP
 - For adolescents and young adults
 - Less than 90 mm Hg systolic BP
 - More than 30% drop from the patient's normal BP
 - Cardiac arrest
 - Arrhythmia
- Integument
 - Urticaria
 - Erythema/hives
 - Angioedema

Laboratory/Diagnostic Studies (Sicherer & Wood, 2013)

Once a thorough history and assessment are completed by the clinician and a food allergy is suspected, a referral to an allergist should be ordered, especially if the introduction of peanut products is being considered. Because many children present with different symptoms of varying severities, all patients suspected

of having a food allergy of any kind should be referred to an allergist (ACAAI, 2014). One might expect one or more of the following diagnostic studies or recommendations to result from consultation:

- Skin prick test: A small amount of the allergen's antigen is introduced into the child's skin by means of a skin prick. Approximately 15 minutes later, the site is evaluated for severity of hives/redness compared with a control site.
- Serum peanut-specific IgE concentration levels: The level of peanut-specific IgE is measured in the child's blood.
- Food elimination diet: The most obvious offending agents are removed from the child's diet to see if there is a decrease or elimination of symptoms.
- Oral food challenge (criterion standard): A highly accurate test that remains the criterion standard in the diagnosis of food allergy. The provider feeds the patient small, measured amounts of the offending food, in increasingly larger amounts, until an adverse reaction or no reaction is observed.

DIFFERENTIAL DIAGNOSIS

- Atopic dermatitis
- Urticaria
- Asthma
- Esophagitis
- Gastritis
- Enterocolitis
- Celiac disease
- Allergic colitis
- Lactose intolerance
- Inflammatory bowel disease
- Irritable bowel syndrome

MANAGEMENT

- Child with known peanut allergy
 - Prevention is the mainstay of therapy because no treatment or ongoing therapy exists.
 - Avoidance is very difficult because many products contain less-obvious peanut products (e.g., fruit snacks, baked goods, candies, fried foods, and graham cracker crust; (*Kids with Food Allergies*, 2015)).
- Child without known peanut allergy
 - Low risk (no history of eczema)
 - Introduction of age-appropriate peanut products can begin as early as 4 months based on family preference.
 - Moderate risk (a history of mild to moderate eczema)

- Consider introduction of peanut products at 6 months after consultation with the child's pediatric provider to inquire about the potential need for allergy testing.

- High risk (a history of severe eczema)

- Referral to an allergist should be made for testing before the introduction of peanut products (*Togias et al.*, 2017).

Treatment of Allergic Reaction (*Epocrates, Inc*, 2016; *Sicherer et al.*, 2017)

Mild/moderate

- Administration of an antihistamine is also appropriate.

- Diphenhydramine

- Age 2 to 11 years: 1 to 2 mg/kg/dose oral (PO)/intramuscular (IM)/intravenous (IV), every 6 hours as needed, with a maximum 50 mg/dose, not exceeding 300 mg/day (*Epocrates, Inc*, 2016)
- Age 12 years and older: 20 to 50 mg PO/IM/IV every 2 to 4 hours as needed, not exceeding 300 mg/day PO or 400 mg/day for IM/IV (*Epocrates, Inc*, 2016)

- Cetirizine for localized cutaneous symptoms

- Age 2 to 5 years: 2.5 to 5.0 mg PO daily. No more than 5 mg/day (*Epocrates, Inc*, 2016).
- Age older than 5 years: 5 to 10 mg PO daily. No more than 10 mg/day (*Epocrates, Inc*, 2016).

Severe

- Injectable IM epinephrine

- Auto injectors for children who weigh less than 15 kg

- Although there is concern that the 0.15-mg dose of epinephrine at 1:1,000 (1mg/1mL) may be high for a child less than 15 kg, the consensus at this time remains that the benefit still outweighs the risk. Therefore, current guidelines recommend the 0.15-mg epinephrine 1:1,000 (1mg/1mL) auto injector for children weighing less than 15 kg (*Sicherer et al.*, 2017).

- Auto injectors for children who weigh 15 to 30 kg

- Epinephrine 1:1,000 (1mg/1mL) 0.15-mg dose: may repeat dose once after 5 to 15 minutes if needed (*Sicherer et al.*, 2017).

- Auto injectors for children who weigh more than 30 kg
 - Epinephrine 1:1,000 (1mg/1mL) 0.3-mg dose: may repeat once after 5 to 15 minutes if needed (Sicherer et al., 2017).

■ Injectable IM

- Epinephrine 1:1,000 (1mg/1mL) at a dose of 0.01 mg/kg, with a maximum dose of 0.3 mg for pre-pubertal patients and 0.5 mg for adolescent patients. This dose can be repeated every 5- to 15 minutes up to two times if the desired response is not achieved (Sicherer et al., 2017).
- Transport to the nearest emergency department for follow-up and further treatment or call 911.

REFERRAL (AMERICAN COLLEGE OF ASTHMA AND IMMUNOLOGY, 2014)

- Referral should be made to an allergist when any individual is suspected of having a food allergy or has experienced signs or symptoms of anaphylaxis.
- When considering introduction of peanut products to those with a suspected allergy, the following are recommended:
 - Infant with mild to moderate eczema: consider referral to an allergist before the introduction of peanut products.
 - Infant with severe eczema: refer to allergist for testing before the introduction of peanut products.

EDUCATION

- The members of the primary care team are responsible for educating caregivers on the signs and symptoms of peanut allergies and instructing them to seek medical attention for symptoms.
- The clinician gives information to families regarding the introduction of peanut products at 6 months of age based on the infant's history of eczema and reviews with parents the symptoms of an allergic reaction.
- The clinician should also help devise and provide the patient with a personalized action plan. The patient should be given a written plan to be used as a quick reference containing information on signs, symptoms, and initial treatment of anaphylaxis that emphasizes calling 911 first and foremost (Sicherer et al., 2017).
- If a child is allergic to peanuts, the provider should also provide patients with information on peanut-containing foods (e.g., peanuts, cashews, mixed

nuts, beer nuts, peanut butter, peanut oil, peanut flour, goobers, ground nuts) and the less-obvious sources of peanut products (e.g., Asian food, Mexican food, African food, baked food, candy, meat substitutes, marinades, and sauces; (Kids with Food Allergies, 2015)).

REFERRALS, SUPPORT GROUPS, AND DRUG ASSISTANCE

Helpful Web Sites and Handouts

- Kids with Food Allergies (<http://www.kidswithfoodallergies.org/page/food-allergy-topics.aspx>)
- F.A.R.E. (<https://www.foodallergy.org/allergens/peanut-allergy?gclid=COTxjaDG4NMCFZqNswod-PoMKw>)

FUTURE CONSIDERATIONS

Nearing Readiness for Practice

Food oral immunotherapy (OIT)

Patients receive a small dose of the food to which they are allergic. Over a period of months, this dose is increased incrementally until a goal dose is reached. The objectives of this therapy re to have the patient become less sensitive to the allergen and to potentially eliminate adverse reactions to the food allergen. This therapy had an 86% desensitization in subjects (Wood, 2016).

Food sublingual immunotherapy

Small amounts of liquid drops containing the food allergen are placed under the patient's tongue. As seen in the OIT method, these doses are increased gradually, with the goal of desensitization. This method has not been as successful as OIT (Wood, 2016).

Epicutaneous immunotherapy

A small amount of the offending antigen is absorbed through the skin via a patch containing small amounts of the allergen. Similar to medication patches, the food allergen is slowly released into the body. The goal of this therapy is a patient's eventual development of tolerance to the allergen, thus minimizing or eliminating future allergic reactions (Wood, 2016).

Theoretic Therapies Needing Further Research

Modified food allergens

Genetically altered food products are given to patients. The offending allergen's amino acid chain is altered, and the body's response to the protein is also altered. The goal of this intervention is for the immune system to be unable to easily recognize the new substance and, therefore, for the reaction to be minimized. Research is in the early phases; the safety profile is unknown.

Probiotics

Similar to their use in eczema, probiotics are given for food allergies with the goal of altering the gastrointestinal immune system and thereby altering the immune response. Consumption of probiotics is theorized to help improve the host's balance of bacteria intestinal flora. According to the Journal of Allergy and Clinical Immunology, a 2015 double blind placebo controlled study has shown that probiotic use reduced the cutaneous reaction to some food antigens. Insufficient evidence exists to support widespread adoption of this practice (Wood, 2016).

Anti-IgE medication

By prescribing medications that are specific to the body's IgE antibodies, the body's threshold for the allergen increases. These medications prevent IgE from binding to mast cells and basophils, thereby minimizing the allergic response to the offending agent. The end result is a reduction in freely circulating IgE, a minimized release of histamine and inflammatory mediators, and a significantly higher dose of the allergen needed to trigger an adverse reaction. Research is still ongoing (Berin, 2014).

CONCLUSION

With peanut allergies becoming increasingly more common, clinicians need to be more aggressive in their identification, management, and prevention. Because there is no cure or ongoing treatment for peanut allergies, emergency medications remain the only means of treating a severe allergic reaction to peanuts. However, prevention is key. More

Early introduction of peanut products may be the best strategy for preventing an allergy to peanuts.

important, based on the most recent research, early introduction of peanut products may be the best strategy for preventing an allergy to peanuts.

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