

11-22-2016

Introducing Allergenic Food into Infants' Diets: Systematic Review

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Abstract

Purpose: The purpose of this systematic review was to explore the association between timing of introduction of potentially allergenic foods to infants and development of food allergies.

Methods: CINAHL, Medline, PubMed, Science Direct, and Web of Science were searched using the terms solid food, complementary food, or infant feeding combined with allergy or hypersensitivity for articles published in English in 2000 or later. Inclusion criteria were 1) primary research articles with 2) a focus on association between introduction of complementary foods including potentially allergenic foods into diets of infants less than 12 months of age and development of food allergies. Articles were excluded if they were 1) not primary research, 2) about complementary foods only (without specificity of allergenic foods), or 3) on allergic conditions other than food allergy (such as asthma or eczema).

Results: The initial literature search yielded 533 articles; 14 articles met inclusion criteria. Level of evidence of each study was determined with the SORT criteria. Results found that delayed introduction

of solid foods in general and allergenic foods in particular was not associated with decreased risk for allergic diseases among high and low-risk infants. Later introduction was associated with increased risk for allergy development.

Clinical Implications: For infants at low risk for development of food allergies, providers should advise caregivers to introduce potentially allergenic foods with other solid foods between 4 and 6 months of age when children show an interest in eating solids. Infants at high risk for peanut allergy, should be evaluated by an allergy specialist prior to introduction of peanuts and work with providers to create an individualized plan for introduction of peanuts and other allergenic foods as needed.

Key words: Allergy; Complementary feeding; Food hypersensitivity; Infant

Introduction of potentially allergenic foods has been a topic of discussion in primary care for many years. In the 1970s there was a noted increase in incidence of celiac disease coinciding with introduction of wheat into infants' diets at 3 months of age. In response, experts hypothesized that complete avoidance of allergenic foods during immune development might prevent food allergies and recommended delay of introduction of all solids until after 4 months of age ([Koplin & Allen, 2014](#)). Formerly, the American Academy of Pediatrics (AAP) ([Greer, Sicherer, & Burks, 2008](#)) and the American College of Allergy, Asthma, and Immunology (ACAAI) ([Fiocchi, Assa'ad, & Bahna, 2006](#)) recommended delay of introduction of potentially allergenic foods including avoidance of cow's milk protein and chicken eggs until 2 years of age, and peanuts and seafood until 3 years of age ([Agostoni et al., 2008](#); [Chan et al., 2014](#); [Zeiger, 2003](#)). Recently, international experts including the AAP, ACAAI, and the American Academy of Allergy, Asthma & Immunology among others published consensus recommendations on introduction of peanuts, including introduction of peanut-containing products into diets of low- and high-risk infants between ages 4 and 11 months of age ([Fleischer et al., 2015](#)). Infants with onset of allergies or severe eczema in the first 4 to 6 months of life may be evaluated by an allergy specialist to determine the appropriateness of early introduction to peanuts (Fleischer et al.).



Since the publication of recommendations to delay introduction of potentially allergenic foods to infants, prevalence of food allergies in children has increased. Since 1997, food allergies among children under 18 years of age have increased approximately 50%, with 6% to 8% of children birth to 18 years of age now affected ([Jackson, Howie, & Akinbami, 2013](#); [Schnabel et al., 2010](#)). Chicken eggs, cow's milk, peanuts, fish, nuts, wheat, and soy are the most likely foods to induce an immune response in infants and children ([Fiocchi et al., 2006](#)). The increase in food allergies since caregivers began delaying introduction of potentially allergenic foods has led experts to reevaluate recommendations regarding introduction of these foods in infants' diets.

Background

Allergic sensitization is the production of specific IgE antibodies that initiate risk of allergy to a food or other allergen ([Joseph et al., 2011](#)). Although sensitization does not always confer allergy, it is necessary for allergy to occur. Many people with sensitization do not experience allergic symptoms. Allergy is a response to an allergen in which specific IgE antibodies that are present in a sensitized person, activate mast cells and basophils leading to an inflammatory response ([Portnoy, 2015](#)). This response causes varying levels of severity of symptoms. Mild symptoms include hives, an itchy mouth or ear canal, nausea or vomiting, diarrhea, stomach pain, sneezing and rhinitis, slight, dry cough, and/or an odd taste in mouth ([Food Allergy Research and Education, Inc., 2016](#)). Severe symptoms may be signs of impending anaphylaxis and warrant immediate treatment. Severe symptoms of allergy include obstructive swelling of the lips, tongue, and/or throat; trouble swallowing; shortness of breath or wheezing; drop in blood pressure; loss of consciousness; chest pain; a weak pulse; and/or a sense of “impending doom” (Food Allergy Research and Education, Inc.).

Previously it was thought that allergic sensitization to food occurred through oral exposure and therefore prevention of food allergies was achieved by delaying the exposure to potentially allergenic foods ([Sansotta et al., 2013](#)). Currently, a dual allergen hypothesis is proposed. Early oral consumption of food proteins induces oral tolerance that prevents allergic sensitization. Oral tolerance is a permanent immunologic state in which frequent and repeated antigen exposures do not result in allergic reactions ([Sansotta et al.](#)). Early cutaneous exposure to allergenic foods leads to allergic sensitization to these foods. Cutaneous allergen exposure without oral tolerance can lead to development of allergies. Cutaneous exposure to allergenic foods can occur when the foods are handled and prepared in households and ingested by other family members. Infants' skin may come in contact with food proteins on family members' hands, mouths, utensils, or dishes. A recent study provided evidence for the cutaneous exposure

hypothesis; researchers found an increased incidence of peanut allergy in infants from households where there was high peanut consumption in family members and no consumption by the infant. Infants in the same study who consumed peanuts were protected from this increased risk of allergy development ([Koplin & Allen, 2014](#)).

The period of time from age 4 to 7 months has been referred to as a window of opportunity to prevent food allergies ([Sansotta et al., 2013](#)). Delaying introduction of potentially allergenic foods orally past the window of opportunity may prevent infants from developing tolerance to these foods and predispose them to allergy development ([Chan et al., 2014](#); [Kumar et al., 2010](#); [Lack, 2008](#)). This window of opportunity is defined as tolerance induction through allergen exposure at an appropriate time and at appropriate doses early in life while the immune system is still developing ([Koplin & Allen, 2014](#)). The immune system is predisposed toward development of tolerance to food proteins when exposure occurs through the oral route (Koplin & Allen). In animal models, early oral exposure to proteins does contribute to the development of tolerance to potential allergens (Sansotta et al.). Regular, early exposure to proteins between ages 4 and 7 months may help develop tolerance to food allergens in infants as well (Sansotta et al.).

Purpose

The purpose of this systematic review is to explore the association between timing of introduction of potentially allergenic foods to infants and development of food and other allergic diseases using this research question: among infants, does delaying introduction of potentially allergenic foods until after 12 months of age prevent development of food allergies when compared with introduction of these foods prior to 12 months.

Methods

Search Methods

A comprehensive search of the literature was conducted using the electronic databases CINAHL, Medline, PubMed, Science Direct, and Web of Science ([Figure 1](#)). Search terms included solid food, complementary food, or infant feeding combined with allergy or hypersensitivity. Complementary foods are all solid and liquid foods other than breast milk and infant formula ([Agostoni et al., 2008](#)). The search yielded 554 unique articles published in 2000 or later, written in English, with human subjects. Inclusion criteria were primary research articles with a focus on association between introduction of complementary foods including potentially allergenic foods into diets of infants less than 12 months of age and development of food allergies. Articles were excluded if they were 1) not primary research, 2) about complementary foods only (without specificity of

allergenic foods), or 3) on allergic conditions other than food allergy (such as asthma or eczema). In several articles, allergy, eczema, and/or asthma were investigated and they were included in this review. The literature search yielded 14 articles that fit criteria, including nine prospective cohort studies ([Joseph et al., 2011](#); [Kull, Bergström, Lilja, Pershagen, & Wickman, 2006](#); [Kumar et al., 2010](#); [Luccioli, Zhang, Verrill, Ramos-Valle, & Kwegyir-Afful, 2014](#); [Mihirshahi et al., 2007](#); [Nwaru et al., 2010](#); [Snijders, Thijs, van Ree, & van den Brandt, 2008](#); [Zutavern et al., 2006, 2008](#)), two cross-sectional studies ([Du Toit et al., 2008](#); [Koplin et al., 2010](#)), two randomized controlled trials (RCT) ([Du Toit et al., 2015](#); [Palmer et al., 2013](#)), and one case control study ([Grimshaw et al., 2013](#)) (Figure 1).

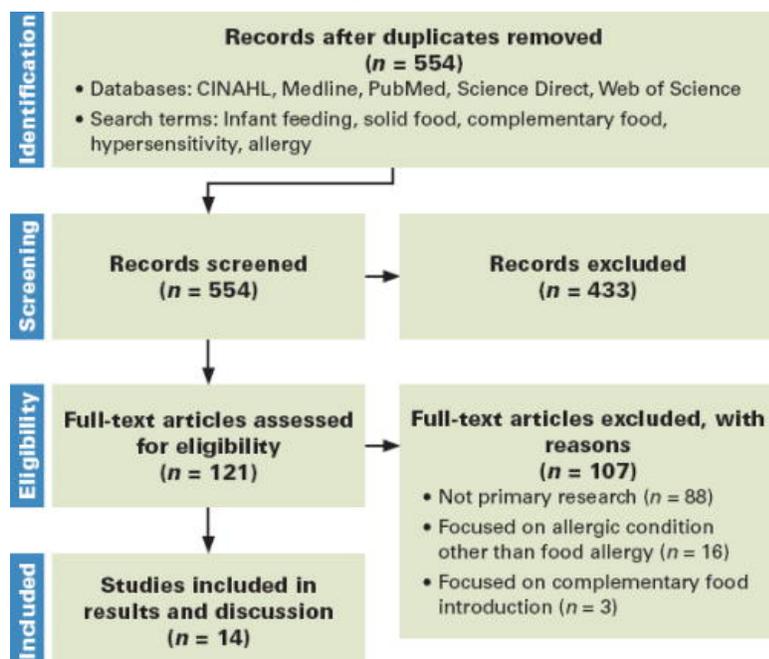


Figure 1. Literature Retrieval Attrition Flow Diagram

Evaluation of Evidence

The level of evidence of each study was critiqued using the Strength of Recommendation Taxonomy (SORT) criteria ([Ebell et al., 2004](#)). The SORT criteria are used to evaluate individual studies or groups of studies based on quality, quantity, and consistency of evidence. Level of evidence of individual studies is rated on a scale of 1 to 3 with 1 being the highest (see Table 1 supplemental digital content, <http://links.lww.com/MCN/A36>). Groups of studies are referred to as bodies of evidence. Strength of recommendation for a body evidence is rated A, B, or C based on quality of studies and consistency of evidence across the group, with level A being the highest (i.e., strong recommendation) and level C

the lowest (weak) (Ebell et al.) (see Table 1 supplemental digital content, <http://links.lww.com/MCN/A36>).

Results

Studies reviewed were of very good quality and included large numbers of children from nine nations. Uniformly, researchers found no evidence that delayed introduction of solid foods in general nor potentially allergenic foods in particular reduced risks for food allergies later in childhood. Nine studies evaluated introduction of allergenic and other complementary foods and food sensitization (Grimshaw et al., 2013; Joseph et al., 2011; Kumar et al., 2010; Luccioli et al., 2014; Mhrshahi et al., 2007; Nwaru et al., 2010; Snijders et al., 2008; Zutavern et al., 2006, 2008). Two explored the association of chicken eggs with allergy development (Koplin et al., 2010; Palmer et al., 2013). Two focused solely on introduction of peanuts (Du Toit et al., 2008, 2015) and one focused only on fish (Kull et al., 2006). In six studies, no association was found between timing of introduction of solid foods and development of allergy (Table 2) (Joseph et al.; Kumar et al.; Luccioli et al.; Mhrshahi et al.; Palmer et al.; Zutavern et al., 2008). Four studies reported early introduction was associated with decreased risk of allergy development (Table 3) (Du Toit et al., 2008, 2015; Koplin et al.; Kull et al.) and three studies found late introduction was associated with increased risk for allergy development (Table 4) (Nwaru et al.; Snijders et al.; Zutavern et al., 2006).

Author (Year)	Setting and Sample	Design	Level of Evidence	Major Findings
Joseph et al. (2011)	Detroit, Michigan N = 594 Ages 0–36 months	Prospective cohort	2	No significant difference in risk of sensitization to eggs or peanuts between infants introduced to solid foods < or >4 months. High-risk infants introduced to peanuts at <4 months had lower risk of peanut allergy than those introduced later, OR _{adj} 0.2 [CI 0.1–0.7], p < .01.
Kumar et al. (2010)	Chicago, Illinois N = 960 Ages 0–7 years	Prospective cohort	1	Timing of food introduction did not modify developing food allergy among children with eczema.
Luccioli et al. (2014)	United States N = 1,363 Ages 0–72 months	Prospective cohort	2	Timing of complementary food (including egg, peanut, and fish) introduction to high- and low-risk infants was not significantly associated with probable food allergy.
Mhrshahi et al. (2007)	Sydney, Australia N = 516 Ages 0–60 months	Prospective cohort	1	No significant difference in risk of allergic reaction at age 5 years between infants introduced to cow's milk, eggs, nuts, or fish at < or >9 months of age.
Palmer et al. (2013)	Australia N = 86 Ages 4–12 months	RCT	1	No significant differences in presence of egg allergy between infants introduced to egg at <4 months and those introduced at >8 months.
Zutavern et al. (2008)	Germany N = 2,073 Ages 0–60 months	Prospective cohort	2	No significant difference in risk for food sensitization between infants introduced to solid food before and after 6 months.

Table 2. Studies Showing No Association between Timing of Introduction and Allergy Development

Author (Year)	Setting and Sample	Design	Level of Evidence	Major Findings
Du Toit et al. (2008)	Israel and United Kingdom N = 8,600 Ages 4–18 years	Cross-sectional	2	Prevalence of peanut allergy significantly lower among children who ingested peanuts in infancy than those who did not, RR _{adj} 9.8 [CI 3.1–30.5], p<0.001.
Du Toit et al. (2015)	United Kingdom N = 640 Ages 0–60 months	RCT	1	Among low-risk infants, 13.7% of those who did not eat peanuts in the first 2 years of life and 1.9% of those who ate peanuts in the first 2 years of life were allergic to peanuts at 60 months of age, RR 86 [95% CI, 3.4–20.3], p<0.001. Among high-risk infants, 35.3% of the avoidance group and 10.6% of the consumption group were allergic to peanuts, RR 70 [95% CI, 4.9–43.3], p = 0.004.
Koplin et al. (2010)	Melbourne, Australia N = 2,589 Ages 11–15 months	Population-based cross-sectional	2	Infants introduced to eggs at 4–6 months had lower risk of egg allergy than those introduced at ≥7 months (p < .001).
Kull et al. (2006)	Stockholm, Sweden N = 4,089 Ages 0–48 months	Prospective birth cohort	1	Infants introduced to fish between 3 and 8 months had a lower risk of sensitization at age 4 years than children introduced at ≥9 months, OR _{adj} 0.78 [CI 0.64–0.95].

Table 3. Studies Showing Early Introduction Is Associated with Decreased Risk for Allergy Development

Author (Year)	Setting and Sample	Design	Level of Evidence	Major Findings
Nwaru et al. (2010)	Finland N = 994 Ages 0–60 months	Population-based prospective cohort	1	Infants introduced to eggs after 10.5 months had higher risk of egg allergy than those introduced earlier, OR _{adj} 2.26 [1.25–4.08], p < .01. Infants introduced to fish after 8.2 months (OR _{adj} 2.42 [CI 1.48–3.95], p < 0.01) and eggs after 10.5 months (OR _{adj} 2.02 [CI 1.23–3.32], p < .01) had a higher risk of sensitization to any food allergens.
Snijders et al. (2008)	Netherlands N = 2,558 Ages 0–24 months	Prospective cohort	1	Timing of introduction of cow's milk was not related to sensitization to cow's milk. Delayed introduction of solid foods (i.e., >7 months) was associated with an increased risk for any sensitization in the first 2 years of life (p = .01).
Zutavern et al. (2006)	Germany N = 2,612 Ages 0–24 months	Prospective cohort	1	Infants introduced to egg after 6 months had higher risk of (OR _{adj} 1.26 [CI 0.65–2.46]) allergic symptoms than those introduced earlier. No significant difference in allergic symptoms between infants introduced to fish < and >6 months.

Table 4. Studies Showing Late Introduction Is Associated with Increased Risk for Allergy Development

No Association between Timing of Introduction and Allergy Development

A prospective cohort study of 594 maternal–infant pairs revealed that early introduction of complementary foods (<4 months) among high- and low-risk children (those with and without a parental history of allergy, atopic disease, or asthma) was not significantly related to food sensitization at 2 to 3 years of age (Joseph et al., 2011). A prospective cohort study including 1,123 infants also found no significant differences in risk for food sensitization between infants introduced to solid food before or after 6 months (Zutavern et al., 2008). A prospective cohort study of 1,363 high- and low-risk infants revealed that timing of complementary food introduction was not associated with development of food allergies (Luccioli et al., 2014). A prospective cohort study of infants at risk due to family history of asthma found introduction of solid foods after 3 months did not prevent onset of

asthma, eczema, or sensitization to food allergens by 5 years of age ([Mihirshahi et al., 2007](#)).

Early Introduction Associated with Decreased Allergy Development

Researchers in Sweden conducted a prospective birth cohort study including 4,089 infants and reported that low-risk children who ate fish at least twice per month during their first year of life had a decreased risk for allergic diseases at age 4 years ([Kull et al., 2006](#)).

Allergic diseases included sensitization to food and airborne allergens, asthma, eczema, and allergic rhinitis. Fish provide omega-3 fatty acids that are important for cognitive and immune function ([Agostoni et al., 2008](#)). The effect on immune function is believed to be protective against allergy development. Introduction to fish at between 3 and 8 months of age was associated with reduced risks for fish allergy, asthma, eczema, and allergic rhinitis at 4 years of age compared with children who were introduced to fish at 9 months of age or older (Kull et al.). The Learning Early about Peanut Allergy (LEAP) trial was recently published ([Du Toit et al., 2015](#)). This study was a randomized, open-label controlled trial to determine whether the early introduction of peanut could prevent children from developing a peanut allergy. High-risk infants ages 4 to 11 months with eczema, egg allergy, or both of age were randomly assigned to consume or avoid consumption of peanut protein. Infants introduced to peanuts before 12 months of age had significantly less peanut allergies. The researchers concluded that early oral introduction of peanuts to high-risk infants significantly decreased development of peanut allergies ([Du Toit et al., 2015](#)).

Late Introduction Associated with Increased Allergy Development

A large population-based prospective cohort study in Finland revealed that late introduction of solid foods (potatoes > 4 months, oats > 5 months, wheat > 6 months, fish > 8.2 months, and eggs > 10.5 months) was associated with an increased risk of sensitization to food and inhaled allergens ([Nwaru et al., 2010](#)). A prospective birth cohort study of 2,558 infants in the Netherlands also found late introduction of solid foods (>7 months of age) was associated with an increased risk for sensitization at the age of 2 years ([Snijders et al., 2008](#)). In a population-based cross-sectional study including 2,589 infants, introduction of chicken eggs at 10 to 12 months of age was associated with a higher risk of egg allergy regardless of allergy risk factors compared with introduction at 4 to 6 months ([Koplin et al., 2010](#)). This phenomenon was also demonstrated in a prospective cohort study including 2,612 infants. In this study, infants introduced to chicken eggs after 6 months had a higher risk for allergy symptoms than those introduced earlier ([Zutavern et al., 2006](#)).

In an observational study, prevalence of peanut allergies among 8,600 Jewish children living in Israel and in the United Kingdom was compared. Children in Israel commonly ingested peanut protein during the first year of life compared with their counterparts in the United Kingdom who ingested almost no peanut protein. The children in Israel had one tenth of the prevalence of peanut allergies than the children in the United Kingdom experienced ([Du Toit et al., 2008](#)). The researchers reported a strong inverse association between peanut consumption in infancy and the prevalence of peanut allergy in childhood.

Special Considerations for High-Risk Infants

High-risk infants can be defined as those having a parent or a sibling with food allergy, asthma, atopic dermatitis, and/or allergic rhinitis ([Chan et al., 2014](#)). Infants with eczema have an increased incidence of food allergies compared with children without eczema ([Lack, 2008](#); [Luccioli et al., 2014](#)). It is unclear whether the association between eczema and food allergies is due to innate or extrinsic (coincidental) mechanisms. For example, children with eczema often have disrupted skin integrity, which can increase risk of cutaneous exposure to allergenic foods leading to subsequent sensitization to allergens (Lack). For high-risk infants, there is conflicting evidence that exposure to allergenic foods during the window of opportunity prevents allergy. One cohort study of 594 maternal–infant pairs found in children with a parental history of asthma or allergy, introduction of complementary foods at less than 4 months of age was associated with a lower risk for peanut sensitization by 2 to 3 years of age compared with children that were introduced to complementary foods at older than 4 months of age ([Joseph et al., 2011](#)). The researchers noted, however, that further research was needed before drawing conclusions regarding a causal relationship between complementary foods introduction and peanut sensitization. In an RCT including 86 infants with eczema, early exposure to egg did not result in significantly less egg sensitization at 12 months of age. Further, 36% of the infants were sensitized to eggs prior to 4 months of age and before introduction of complementary foods. Route of exposure is unknown but may have occurred in utero across the placenta, through skin exposure after birth or through breast milk. Researchers concluded that caution must be exercised when first introducing allergenic foods to this high-risk group ([Palmer et al., 2013](#)). In a nested case-control within a cohort study of high-risk infants, introduction of solid foods before 17 weeks of age was associated with food allergy development; thus, researchers recommended introduction of solid foods between 17 and 24 weeks ([Grimshaw et al., 2013](#)). In another prospective cohort study, among children with eczema, timing of food introduction was not associated and did not increase or decrease risks for allergy develop ([Kumar et al., 2010](#)).

Clinical Implications

In this systematic review of 14 studies, nine studies included level 1 evidence (Du Toit et al., 2015; Grimshaw et al., 2013; Kull et al., 2006; Kumar et al., 2010; Mahrshahi et al., 2007; Nwaru et al., 2010; Palmer et al., 2013; Snijders et al., 2008; Zutavern et al., 2006) and five studies were level 2 (Du Toit et al., 2008; Joseph et al., 2011; Koplin et al., 2010; Luccioli et al., 2014; Zutavern et al., 2008) meriting a level A for the strength of recommendation from this body of evidence (Ebell et al., 2004). Based on this review, there was no evidence that delaying allergenic foods beyond 4 to 8 months of age is beneficial in reducing allergies in infants. Delaying introduction of potentially allergenic foods beyond 9 months, including chicken eggs, peanuts, and fish, may increase the risk of developing food allergies. For low-risk infants, nurses should advise parents to begin introducing solid foods, including potentially allergenic foods, between 4 and 6 months of age and when children show interest in eating solid foods (Table 5) (Agostoni et al., 2008; Chan et al., 2014; Greer et al., 2008). Age-appropriate peanut-containing foods should be freely introduced with other solid foods to low-risk infants at 4 to 6 months (Togias et al., 2016). Diets rich in fruits and vegetables and homemade foods with less processed foods also appear to be associated with less food allergies (Grimshaw et al., 2014).

Potential Caregivers/ Parents' Questions	Suggested Registered Nurse Responses
What are the most common allergenic foods?	The most common allergenic foods are eggs, peanuts, fish, milk, and wheat.
Doesn't early introduction cause allergies?	Current evidence does not show that delaying allergenic foods prevents allergy development. Delaying potentially allergenic foods (chicken eggs, peanuts, fish) past 9 months of age may increase children's risks for developing food allergies.
What are best foods to feed my child when beginning solid food introduction?	There is no one best food, but starting with rice cereal mixed with breast milk or formula is texturally a good transition. Diets rich in fruits and vegetables as well as less processed foods and more homemade foods appear to be associated with less food allergy development. All foods should be included in introduction including peanuts, fish, milk, and wheat. Continue to breastfeed to promote optimal nutrition.
I have a strong family history of food allergies and I am afraid my child will have a reaction the first time they eat these foods.	Children with familial history of food allergies may be evaluated by an allergy specialist to create an individualized plan for introducing allergenic foods. Allergenic foods may be introduced under surveillance in a healthcare setting. Having the first consumption in a controlled setting may relieve your concerns and allow for faster treatment if any signs of allergy occur.
Why is this now being recommended?	Researchers studied why food allergies among children were increasing. They found that the practice of delaying allergenic foods may have increased allergies. New research studies have supported that introducing allergenic foods with other solids between 4 and 7 months of age may prevent allergy development. Researchers found no evidence that delaying allergenic foods prevented allergy development.

Table 5. Suggestions for Discussing Introduction of Potentially Allergenic Foods with Caregivers/Parents

The recently published LEAP study provided high-level evidence regarding early introduction of peanuts to high-risk infants (Du Toit et al., 2015). Infants with mild to moderate eczema are at increased risk of peanut allergy. Providers should recommend introduction of peanuts around 6 months of age after successful ingestion of other solid foods (Togias et al., 2016). Introduction of peanuts may occur at home without an in-office allergy evaluation although one may be considered (Togias et al., 2016). Infants at

highest risk for peanut allergy are those with severe eczema and/or egg allergy. High risk infants should have peanut allergy testing prior to introduction of peanuts ([Togias et al., 2016](#)). Introduction of peanuts is based on test results. Families should work with allergy specialists to interpret results and create individualized plans for peanuts and other allergenic foods as needed. Children who are allergic to peanuts, should avoid peanuts and be managed by a specialist. For high risk children, education on signs and symptoms of an allergic reaction is important as well as education about what actions to take if a reaction does occur. In conclusion, the evidence in this review supports current revised recommendations to avoid delayed introduction of allergenic foods and offers evidence needed by nurses to deliver accurate and safe anticipatory guidance to parents and caregivers about infant nutrition. Introduction of potentially allergenic foods at ages 4 to 6 months and when infants are developmentally ready for solid feeding is not associated with increased risk for allergy.

Suggested Clinical Implications

- * Anticipatory guidance on introduction of solid foods at ages 4 to 6 months should include discussion of inclusion of potentially allergenic foods as part of the normal solid food regimen.
- * Parents should be advised delaying potentially allergenic foods (e.g., chickens' eggs, peanuts, fish) does not prevent allergy development and may increase risk for allergies.
- * Diets rich in fruits and vegetables as well as less processed foods and more homemade foods appear to be associated with less food allergy development.
- * Encourage breastfeeding with solid food introduction to promote optimal nutrition.

Instructions for Taking the CE Test Online Introducing Allergenic Food into Infants' Diets: Systemtic Review

- * Read the article. The test for this CE activity can be taken online at www.nursingcenter.com/ce/MCN. Tests can no longer be mailed or faxed.
- * You will need to create a free login to your personal CE Planner account before taking online tests. Your planner will keep track of all your Lippincott Williams & Wilkins online CE activities for you.
- * There is only one correct answer for each question. A passing score for this test is 14 correct answers. If you pass, you can print your certificate of earned contact hours and the answer key. If you fail, you have the option of taking the test again at no additional cost.
- * For questions, contact Lippincott Williams & Wilkins: 1-800-787-8985.

Disclosure Statement:

The authors and planners have disclosed no potential conflicts of interest, financial or otherwise.

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