

Comparison of practice patterns among Canadian allergists before and after NIAID guideline recommendations

Elissa M. Abrams, MD^{a,b}, Lianne Soller, PhD^b,
Alexander G. Singer, MB, BCh, BAO^c,
David M. Fleischer, MD^d, Matthew Greenhawt, MD^d, and
Edmond S. Chan, MD^b



Clinical Implications

- Since publication of the National Institute of Allergy and Infectious Diseases (NIAID) guideline, allergists increasingly characterize infants as high risk because of severe eczema and/or egg allergy, although uncommonly pre-emptively screen. Allergists increasingly offer oral food challenges (OFCs) to peanut in keeping with NIAID guideline recommendations, but still only 42.1% of allergists routinely perform infant OFCs. However, results are reflective only of the population of allergists who responded to the survey.

TO THE EDITOR:

Food allergy prevention has shifted with the publication of the Learning Early About Peanut (LEAP) Study,¹ and subsequent National Institute of Allergy and Infectious Diseases (NIAID) guideline² recommending infants at high risk of peanut allergy (PA) due to severe eczema (SE) and/or egg allergy (EA) be introduced to peanut between 4 and 6 months of age after physician evaluation. With this change in approach, we and others described barriers regarding knowledge translation of this shift in guidance, and feasibility of implementation.³⁻⁵ No study thus far has compared LEAP study knowledge and practice patterns related to pre-emptive peanut evaluation, before and after implementation of the NIAID guideline in a similar population.

A 29-question survey was sent to all members of the Canadian Society of Allergy and Clinical Immunology (CSACI) in July 2016 (after publication of the LEAP study but before publication of the NIAID guideline), evaluating assessment approaches of high-risk infants (Online Repository at www.jaci-inpractice.org). This survey was sent again to the same members in May 2018, over a year after release of the NIAID guideline. Frequencies, percentages, and confidence intervals (CI) were calculated for all questions. The University of Manitoba Research Ethics Board approved this study.

Response rate was 42.5% in 2016 (79 of 196) and 22.0% in 2018 (43 of 196) (Table I). There were significant changes in defining infants at high risk for PA after release of the NIAID guideline (Table II). Significantly fewer allergists categorized infants as high risk if they had a first-degree relative with atopic disease (post-pre -37.6%; 95% CI: -50.7, -24.5), sibling of PA child (-31.8%; 95% CI: -49.6, -14.0), parental PA (-24.5%; 95% CI: -40.4, -8.6), milk allergy (-18.0%; 95% CI: -34.1, -1.9), or rhinitis (-5.6; 95% CI: -10.9, -0.3).

There was no significant difference between 2018 and 2016 in the number of allergists who routinely recommend pre-emptive evaluation before peanut introduction in infants with EA (post: 20.0% [n = 8 of 40] vs pre: 17.4% [n = 12 of 69]; post-pre: 2.6%; 95% CI: -12.7, 17.9) or SE (post: 22.5% [n = 9 of 40] vs 24.6% [17 of 69]; post-pre: -2.1%; 95% CI: -18.6, 14.4) (Table E1, available in this article's Online Repository at www.jaci-inpractice.org).

For a hypothetical case of an infant with SE and/or EA, the majority of allergists in 2016 (78.8%) and 2018 (89.2%) recommended some form of in-office evaluation before peanut introduction (Table E1, available in this article's Online Repository at www.jaci-inpractice.org). At-home introduction of other allergenic foods was recommended by 82.8% (53 of 64) of allergists in 2016 and by 72.1% (31 of 43) of allergists in 2018, although some recommended pre-emptive skin prick test (SPT) or specific IgE to other allergenic foods (18.6% to egg in 2018). There was a significant decrease in 2018 in allergists who recommended in-office observed ingestion of foods other than peanut (post-pre -9.5%; 95% CI: -16.7, -2.3). For an infant with SE and/or EA and positive peanut SPT, there was a significant increase in allergists who would offer an oral food challenge (OFC) at SPT size 4 to 7 mm (post-pre 23.2%; 95% CI: 3.4, 43.0) (Table E1). Wait-times for OFCs were variable (Table E1), with only 11.1% (4 of 36) in 2018 indicating that they perform OFCs on the same day as positive peanut SPT, and 11.1% (4 of 36) in 2018 indicating that they do not offer any infant OFCs. Allergists who performed more OFCs were more likely to perform OFCs sooner than those who performed less OFCs, after adjusting for location (hospital vs community) (β pre-survey = -0.19 [95% CI: -0.35, -0.02]; β post-survey = -0.52 [95% CI: -0.74, -0.30]). In addition, pediatric-trained allergists were more likely to perform OFCs than internal medicine-certified allergists (β pre-survey = 0.72 [95% CI: 0.34, 1.10]; β post-survey = 1.23 [95% CI: 0.78, 1.69]). Only 37.7% (26 of 69) of allergists in 2016 and 42.1% (16 of 38) in 2018 reported that they routinely perform OFCs in infants.

This is the first study to directly examine how the LEAP study and NIAID addendum guideline affected allergist practice. The results raise a number of important issues, highlighting both how allergist practices have changed with the release of the NIAID guideline, and also how feasibility of implementation of this guideline may require further assessment.

A particularly interesting finding was the evolution in interpretation of high PA risk, consistent with the change in definition of high risk of PA in the NIAID guideline (SE and/or EA) compared with previous guidelines (first-degree relative with atopy).^{6,7} Willingness to perform an OFC to peanut at SPT sizes 4 to 7 mm has not been previously evaluated, and these data indicate increasing comfort in doing so since the release of the NIAID guideline.

However, knowledge gaps remain; 18.6% of allergists recommended pre-emptive testing to egg, which is not in keeping with NIAID guideline recommendations. In addition, there was no significant increase in the percentage of allergists who recommended pre-emptive screening before peanut introduction in

TABLE I. Characteristics of respondents

	Pre-NIAID (2016), % (N)	Post-NIAID (2018), % (N)	Post-Pre, % (95% CI)
Respondents	42.5 (79/196)	22.0 (43/196)	
Practice setting			
Community	41.8 (33)	44.2 (19)	2.4 (−16.0, 20.8)
Academic	58.2 (46)	55.8 (24)	−2.4 (−20.8, 16.0)
Location of practice			
Urban/suburban	93.6 (73)	95.4 (41)	1.8 (−0.65, 10.1)
Rural	6.4 (5)	4.6 (2)	−1.8 (−10.1, 0.65)
Length of time in practice			
<10 y	46.6 (34)	56.1 (23)	9.5 (−9.5, 28.5)
≥10 y	53.4 (39)	43.9 (18)	−9.5 (−28.5, 9.5)
Sex			
Male	43.8 (32)	42.5 (17)	−1.3 (−20.4, 17.8)
Female	56.2 (41)	57.5 (23)	1.3 (−17.8, 20.4)
Type of training			
Pediatrics	64.4 (47)	60.0 (24)	−4.4 (−23.1, 14.3)
Internal medicine	35.6 (26)	40.0 (16)	4.4 (−14.3, 23.1)
Frequency of seeing pediatric patients			
Very often/often (multiple times per day-multiple times per week)	87.7 (64)	75.6 (31)	−12.1 (−27.3, 3.1)
Sometimes/seldom/rarely (few times per week-few times per year)	12.3 (9)	24.4 (10)	12.1 (−3.1, 27.3)

CI, Confidence interval; NIAID, National Institute of Allergy and Infectious Diseases.

TABLE II. What constitutes an infant at high risk for peanut allergy*

	Pre, % (N)	Post, % (N)	Post-Pre, % (95% CI)
First degree relative with atopic disease/allergy	42.3 (30)	4.7 (2)	−37.6 (−50.7, −24.5)
Any family history of atopic disease/allergy	5.6 (4)	2.3 (1)	−3.3 (−10.3, 3.7)
Egg allergy	93.0 (66)	83.7 (36)	−9.3 (−21.8, 3.2)
Severe eczema	97.2 (69)	88.4 (38)	−8.8 (−19.1, 1.5)
Milk allergy	36.6 (26)	18.6 (8)	−18.0 (−34.1, −1.9)
Sibling of peanut-allergic child	62.0 (44)	30.2 (13)	−31.8 (−49.6, −14.0)
Parental peanut allergy	40.8 (29)	16.3 (7)	−24.5 (−40.4, −8.6)
History of asthma	16.9 (12)	7.0 (3)	−9.9 (−21.5, 1.7)
History of rhinitis	5.6 (4)	0	−5.6 (−10.9, −0.3)
Other	7.0 (5)	0	−7.0 (−12.9, −1.1)

CI, Confidence interval.

*These categories are not mutually exclusive.

infants with SE or EA, in contrast to the NIAID guideline recommendations. More efforts may be required to emphasize the indications (and lack thereof) of pre-emptive testing before peanut introduction in infants. Unnecessary pre-emptive testing (such as before egg introduction) is not recommended given the potential for false-positive results and possible unnecessary avoidance based on such results, which likely would ironically delay introduction.

Our study emphasizes low comfort in performing infant OFCs (only 42.1% routinely perform them in 2018, and surprisingly 11.1% do not offer infant peanut OFCs despite offering infant SPTs), which must increase for the NIAID guideline to be successfully implemented. An interesting finding is that pediatric-trained allergists were more likely to perform OFCs in infants than internal medicine trained allergists. Another key variable beyond willingness is timeliness—the NIAID guideline suggests that there is a critical window within which to perform these challenges, yet only 11.1% of allergists in 2018 could perform an OFC on the same day as the SPT although 50%

could offer OFCs within a month. Any delay, in particular with high-risk infants presenting closer to 1 year of age, could easily result in conversion from sensitization to clinical allergy, although the survey did not directly address whether allergists would be more likely to expedite the OFC if the infant was closer to a year of age.⁸ Changes in care delivery are required to ensure that high-risk children are able to access OFCs more rapidly.

Limitations included the relatively small sample size, as the pool of practicing allergists in Canada is 10% of that in the United States. Opinions may reflect a sample of Canadian allergists not fully representative of practitioner experience in other jurisdictions, although the CSACI widely disseminated the guideline to its members. Survey responses may represent ideal circumstances instead of actual practice patterns, and there may be a disconnect between response and real life. Response rate decreased in 2018 compared with 2016 and the survey did not capture whether respondents in 2018 had previously done the survey in 2016. Despite these limitations, this is an important

first study of barriers to knowledge translation pre and/or post the NIAID guideline.

In conclusion, this survey of Canadian allergists on early peanut introduction suggests that practice patterns have changed with the release of the NIAID guideline. Our findings highlight a shifting definition of the infant at risk of PA and somewhat increased willingness to offer OFC with SPT 4 to 7 mm, both more closely aligning with NIAID recommendations. However, this survey also identifies persistent major health care system barriers to NIAID guideline implementation, as few allergists post-NIAID routinely perform infant OFCs, and even fewer have the capacity to offer this on the same day as SPTs. Addressing such infrastructure concerns is paramount. Education and practice changes are required to ensure that infants are not avoiding peanut indefinitely based solely on falsely positive SPT and/or sIgE testing, where a provider either is unavailable, unable, or unwilling to offer and/or perform an infant OFC.

Acknowledgments

The authors acknowledge the kind assistance of the CSACI membership, Louise Tremblay, Dr. David Fischer, and Dr. Sandy Kapur.

^aDepartment of Pediatrics, Section of Allergy and Clinical Immunology, University of Manitoba, Winnipeg, Manitoba, Canada

^bDepartment of Pediatrics, Division of Allergy and Immunology, University of British Columbia, Vancouver, British Columbia, Canada

^cDepartment of Family Medicine, University of Manitoba, Winnipeg, Manitoba, Canada

^dDepartment of Pediatrics, Section of Allergy and Immunology, Children's Hospital Colorado, University of Colorado Denver School of Medicine, Aurora, Colo
No funding was received for this work.

Conflicts of interest: E. M. Abrams has received moderator fees and an unrestricted educational grant from Novartis. L. Soller participates in research sponsored by DBV Technologies and is a shareholder in Aimmune Therapeutics. A. G. Singer declares that he has no relevant conflicts of interest. D. M. Fleischer is a member of the scientific advisory council for the National Peanut Board; was a Coordinating Committee and Expert Panel member of the National Institute of Allergy and Infectious Diseases (NIAID)-sponsored Guidelines for Peanut Allergy Prevention; is a member of the scientific advisory council for the National Peanut Board; is a member of clinical advisory boards for Food Allergy Research & Education and Food Allergy & Anaphylaxis Connection Team; has served as a consultant for Aimmune Therapeutics, DBV Technologies, Kaleo Pharmaceutical, and INSYS Therapeutics; and received grant support from DBV Technologies and

Aimmune Therapeutics. M. Greenhawt is supported by grant no. 5K08HS024599-02 from the Agency for Healthcare Quality and Research; is an expert panel and coordinating committee member of the NIAID-sponsored Guidelines for Peanut Allergy Prevention; has served as a consultant for the Canadian Transportation Agency, Thermo Fisher, Intrimmune, and Aimmune Therapeutics; is a member of physician and/or medical advisory boards for Aimmune Therapeutics, DBV Technologies, Nutricia, Kaleo Pharmaceutical, Nestle, and Monsanto; is a member of the scientific advisory council for the National Peanut Board; has received honorarium for lectures from Thermo Fisher, Before Brands, multiple state allergy societies, the American College of Allergy, Asthma, and Immunology, the European Academy of Allergy and Clinical Immunology; is an associate editor for the *Annals of Allergy, Asthma, and Immunology*; and is a member of the Joint Taskforce on Allergy Practice Parameters. E. S. Chan has received research support from DBV Technologies and is a shareholder in Aimmune Therapeutics. He is an expert panel and coordinating committee member of the NIAID-sponsored Guidelines for Peanut Allergy Prevention.

Received for publication February 17, 2019; revised April 29, 2019; accepted for publication April 30, 2019.

Available online May 14, 2019.

Corresponding author: Elissa M. Abrams, MD, Department of Pediatrics, Section of Allergy and Clinical Immunology, University of Manitoba, FE125-685 William Avenue, Winnipeg, MB, R3E 0Z2, Canada. E-mail: elissa.abrams@gmail.com.
2213-2198

© 2019 American Academy of Allergy, Asthma & Immunology

<https://doi.org/10.1016/j.jaip.2019.04.044>

REFERENCES

1. Du Toit G, Roberts G, Sayre PH, Bahnson HT, Radulovic S, Santos AF, et al. Randomized trial of peanut consumption in infants at risk for peanut allergy. *N Engl J Med* 2015;372:803-13.
2. Togias A, Cooper SF, Acebal ML, Assa'ad A, Baker JRJ, Beck LA, 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. *J Allergy Clin Immunol* 2017;139:29-44.
3. Turner PJ, Campbell DE. Implementing primary prevention for peanut allergy at a population level. *JAMA* 2017;317:1111-2.
4. Wood RA, Burks AW. LEAPing forward with the new guidelines. *J Allergy Clin Immunol* 2017;39:52-3.
5. Abrams EM, Singer AG, Soller L, Chan ES. Knowledge gaps and barriers to early peanut introduction among allergists, pediatricians, and family physicians. *J Allergy Clin Immunol Pract* 2019;7:681-4.
6. Chan ES, Cummings C. Dietary exposures and allergy prevention in high-risk infants: a joint statement with the Canadian Society of Allergy and Clinical Immunology. *Paediatr Child Health* 2013;18:545-54.
7. Fleischer DM, Spergel JM, Assa'ad AH, Pongratic JA. Primary prevention of allergic disease through nutritional interventions. *J Allergy Clin Immunol Pract* 2013;1:29-36.
8. Sampson HA, Lack G, Du Toit G. Reply: to PMID 25705822. *J Allergy Clin Immunol* 2015;39:822-3.

ONLINE REPOSITORY

TABLE E1. Testing issues for early introduction of allergenic foods in high-risk infants: SPT, sIgE, and OFC

	Pre, % (N)	Post, % (N)	Post-Pre, % (95% CI)
Does allergist perform OFCs in infants			
Routinely	37.7 (26)	42.1 (16)	4.4 (−15.0, 23.8)
Sometimes	33.3 (23)	26.3 (10)	−7.0 (−24.9, 10.9)
Never/rarely	29.0 (20)	31.6 (12)	2.6 (−15.7, 20.9)
Peanut testing before first ingestion for high-risk infants			
No testing required	21.2 (14)	10.8 (4)	−10.4 (−24.4, 3.6)
Observed ingestion in office (without any skin or specific IgE testing)	18.2 (12)	24.3 (9)	6.1 (−10.6, 22.8)
Skin prick test to peanut	57.6 (38)	62.2 (23)	4.6 (−15.1, 24.3)
Other	3.0 (2)	2.7 (1)	−0.3 (−6.9, 6.3)
Does allergist recommend children with egg allergy be evaluated before peanut introduction			
Routinely	17.4 (12)	20.0 (8)	2.6 (−12.7, 17.9)
Sometimes	31.9 (22)	45.0 (18)	13.1 (−5.8, 32.0)
Never/rarely	50.7 (35)	35.0 (14)	−15.7 (−34.6, 3.2)
Does allergist recommend children with severe eczema/atopic dermatitis be evaluated before peanut introduction			
Routinely	24.6 (17)	22.5 (9)	−2.1 (−18.6, 14.4)
Sometimes	26.1 (18)	50.0 (20)	23.9 (5.3, 42.5)
Never/rarely	49.3 (34)	17.5 (11)	−31.8 (−48.5, −15.1)
If no allergenic foods introduced yet, how to proceed for foods other than peanut*			
SPT/sIgE milk	10.9 (7)	11.6 (5)	0.7 (−11.5, 12.9)
SPT/sIgE egg	15.6 (10)	18.6 (8)	3.0 (−11.6, 17.6)
SPT/sIgE tree nut	9.5 (6)	13.9 (6)	4.4 (−8.2, 17.0)
SPT/sIgE fish/shellfish	4.7 (3)	9.3 (4)	4.6 (−5.5, 14.7)
SPT/sIgE sesame	4.7 (3)	11.6 (5)	6.9 (−4.0, 17.8)
At home introduction	82.8 (53)	72.1 (31)	−10.7 (−27.0, 5.6)
In-office observed ingestion	9.5 (6)	0.00 (0)	−9.5 (−16.7, −2.3)
Next step if peanut SPT/sIgE negative			
Introduce peanut at home	87.9 (58)	91.9 (34)	4.0 (−7.8, 15.8)
Wait on introduction	0.0 (0)	2.7 (1)	2.7 (−2.5, 7.9)
Require OFC before introduction	3.0 (2)	2.7 (1)	−0.3 (−6.9, 6.3)
Other	9.1 (6)	2.7 (1)	−6.4 (−15.1, 2.3)
Peanut SPT size at which OFC offered			
<4 mm	40.9 (27)	13.9 (5)	−27 (−43.4, −10.6)
4-7 mm	37.9 (25)	61.1 (22)	23.2 (3.4, 43.0)
8 mm +	12.1 (8)	25.0 (9)	12.9 (−3.3, 29.1)
Other	9.1 (6)	0.0 (0)	−9.1 (−16.0, −2.2)
Peanut sIgE level at which OFC offered			
<0.35 kU/L	15.2 (10)	5.55 (2)	−9.7 (−21.1, 1.7)
0.35-<2 kU/L	43.9 (29)	38.9 (14)	−5.0 (−24.9, 14.9)
2-14 kU/L	22.7 (15)	27.8 (10)	5.1 (−12.7, 22.9)
>14 kU/L	12.1 (8)	22.2 (8)	10.1 (−5.6, 25.8)
Other	6.1 (4)	5.55 (2)	−0.6 (−10.0, 8.8)
Duration between positive peanut SPT and OFC			
Same day	19.7 (13)	11.1 (4)	−8.6 (−22.6, 5.4)
<1 mo	37.9 (25)	38.9 (14)	1.0 (−18.8, 20.8)
1-4 mo	33.3 (22)	36.1 (13)	2.8 (−16.6, 22.2)
>4 mo	4.55(3)	2.8 (1)	−1.8 (−9.1, 5.6)
Does not perform OFC on infants	4.55 (3)	11.1 (4)	6.6 (−4.9, 18.0)
Location of peanut OFC*			
Community clinic	56.1 (37)	51.2 (22)	−4.9 (−24.0, 14.2)
Outpatient clinic with hospital	51.5 (34)	34.9 (15)	−16.6 (−35.3, 2.1)
Specialized hospital unit	13.6 (9)	11.6 (5)	−2.0 (−14.6, 10.6)
Does not perform OFC on infants	6.1 (4)	9.3 (4)	3.2 (−7.2, 13.6)

CI, Confidence interval; OFC, oral food challenge; SPT, skin prick test.

*These categories are not mutually exclusive.

ALLERGIST SURVEY:

- 1) In what setting do you practice:
 - a. Academic
 - b. Community
 - c. Both
 - d. Other
- 2) How would you describe the location of your practice:
 - a. Urban
 - b. Rural/remote
 - c. Combined (please specify):
 - d. Other:
- 3) What is your gender?
Male
Female
- 4) How long have you been in practice?
 - a. <5 years
 - b. 5 to <10 years
 - c. 10 to <15 years
 - d. ≥15 years
 - e. No longer practicing
- 5) Besides allergy/immunology, which of the following do you have your primary Royal College/Board certification in?
 - a. Paediatrics
 - b. Internal medicine
- 6) In your practice, how often do you see pediatric patients?
 - a. Very often (multiple times per day)
 - b. Often (multiple times per week)
 - c. Sometimes (few times per week)
 - d. Seldom (few times per month)
 - e. Rarely (few times per year)
- 7) Where did you complete your residency training?
 - a. Canada
 - b. USA
 - c. Other (please specify):
- 8) How long do patients typically wait after being referred for evaluation of food allergy?
 - a. <1 month
 - b. 1-2 months
 - c. 2-4 months
 - d. 4-6 months
 - e. 6-12 months
 - f. Over a year
- 9) If a 6-month-old high-risk infant is referred to you for peanut introduction, how long would they typically have to wait to see you?
 - a. <1 month
 - b. 1-2 months
 - c. 2-4 months
 - d. 4-6 months
 - e. 6-12 months
 - f. Over a year
- 10) How long do patients typically wait from time of clinical assessment to scheduling of oral food challenge if required?
 - a. <1 month
 - b. 1-2 months
 - c. 2-4 months
 - d. 4-6 months
 - e. 6-12 months
 - f. Over a year
 - g. I rarely do oral challenges in children

- 11) Is there a billing fee code in your province for performing oral challenges?
 - a. Yes
 - b. No
 - c. Unsure

- 12) At what age do you recommend introduction of the following solid foods into the diet of children?

Food:	4 to <6 months	6 months to <1 year	1 year to < 2 years	2 years to <3 years	≥3 years
Solid foods					
Eggs					
Milk					
Peanut					
Other nuts					
Fish/shellfish					
Sesame					

- 13) What constitutes a high-risk child for the development of peanut allergy (check all boxes that apply):
 - a. First degree relative with atopic disease/allergy
 - b. Any family history of atopic disease/allergy
 - c. Egg allergy
 - d. Severe eczema
 - e. Milk allergy
 - f. Sibling of peanut allergic child
 - g. Parental peanut allergy
 - h. History of asthma
 - i. History of rhinitis
 - j. Other:
- 14) Do you recommend children with egg allergy be evaluated by an allergist before peanut introduction?
 - a. Never
 - b. Rarely
 - c. Sometimes
 - d. Routinely
- 15) Do you recommend children with severe eczema/atopic dermatitis be evaluated by an allergist before peanut introduction?
 - a. Never
 - b. Rarely
 - c. Sometimes
 - d. Routinely
- 16) Please estimate the number of referrals you receive per year requesting pre-emptive testing in an infant before food introduction?
 - a. Less than 10
 - b. 11-25
 - c. 26-50
 - d. Greater than 50
- 17) Please estimate the number of referrals per month you have received for pre-emptive testing to peanut in children with egg allergy or severe eczema since publication of the LEAP study?
 - a. Less than 5
 - b. 5-10
 - c. 11-25
 - d. 26-50
 - e. Greater than 50

- 18) Do you perform oral food challenges in infants (4 months to <1 year)?
 - a. Never
 - b. Rarely
 - c. Sometimes
 - d. Routinely
- 19) Please consider your potential evaluation of a 6-month-old infant with egg allergy or severe eczema for consultation before peanut introduction:
 - a. What would be your first diagnostic test (if any)?
 - i. No testing required (would encourage home introduction without testing)
 - ii. Observed ingestion in office (without any skin or specific IgE testing)
 - iii. Skin prick test to peanut
 - iv. Specific IgE to peanut
 - v. Other (please specify):
 - b. If you discovered at the first visit that none of the allergenic foods had been introduced yet, how might you proceed for foods other than peanut (check all that apply)?
 - i. Skin prick of specific IgE test to milk
 - ii. Skin prick or specific IgE test to egg
 - iii. Skin prick or specific IgE test to tree nuts
 - iv. Skin prick or specific IgE test to fish/shellfish
 - v. Skin prick or specific IgE test to sesame
 - vi. All of the above
 - vii. None of the above (would encourage at home introduction of the above foods without delay)
 - viii. None of the above (would encourage in-office observed ingestion of the above foods without delay)
 - c. If peanut skin prick testing or specific IgE was performed and found to be negative, how would you counsel the family?
 - i. Introduce peanut into the diet at home
 - ii. Wait on introduction
 - iii. Require an oral food challenge before introduction
 - iv. Other (please specify)
 - d. If peanut skin prick testing was positive, at what skin test size would you consider an oral food challenge (check all that apply)?
 - i. <3 mm
 - ii. 3 to <4 mm
 - iii. 4 to <5 mm
 - iv. 5 to <6 mm
 - v. 6 to <7 mm
 - vi. 7 to <8 mm
 - vii. >8 mm
 - viii. Other (please specify)
 - e. If peanut specific IgE was done and positive, at what level would you consider an oral food challenge (check all that apply)?
 - i. <0.35 kU/L
 - ii. 0.35-2 kU/L
 - iii. 2-14 kU/L
 - iv. >14 kU/L
 - v. Other (please specify)
 - f. In how many months would you book this infant for a peanut oral challenge?
 - i. Same day as the skin test
 - ii. <1 month
 - iii. 1-2 months
 - iv. 2-4 months
 - v. 4-6 months
 - vi. 6-12 months
 - vii. Over a year
 - viii. I don't do oral challenges in infants <1 year
 - g. Where would you do this peanut oral challenge?
 - i. Community clinic
 - ii. Outpatient clinic within a hospital
 - iii. Specialized hospital unit (eg, medical day unit or similar)
 - iv. I don't do oral challenges in infants <1 year
- 20) Do you believe that there are harms to introduction of solid foods between 4 and 6 months of age?
 - a. Yes (please comment)
 - b. No
- 21) Do you believe that breastfeeding rates will be affected with introduction of solid foods between 4 and 6 months of age?
 - a. Yes
 - b. No
- 22) When counseling on regular exposure to a food, what is the frequency that you counsel ongoing exposure to the food?
 - a. Less than once a month
 - b. Every 2-4 weeks
 - c. Every 1-2 weeks
 - d. 1-2 times a week
 - e. 3 times a week
 - f. More than 3 times a week
- 23) When counseling on regular exposure to a food, approximately what amount do you counsel for each exposure (using peanut butter as an example)?
 - a. Less than 0.5 teaspoon
 - b. 0.5 teaspoon
 - c. 1 teaspoon
 - d. 2 teaspoons
 - e. Whatever amount the parent feels most comfortable with
- 24) When counseling on regular exposure to a food, how long do you suggest the parent continue ongoing exposure for?
 - a. 1 year
 - b. 2-3 years
 - c. 3-5 years
 - d. 5-10 years
 - e. longer than 10 years
 - f. Whatever duration the parents feel most comfortable with