

FOOD ALLERGY PREVENTION – WHERE WE’VE BEEN, WHERE WE ARE AND WHERE WE ARE GOING

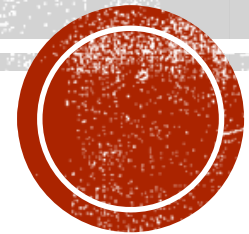
Elissa Abrams, MD, FRCPC, MPH (Johns Hopkins;2020 Candidate)

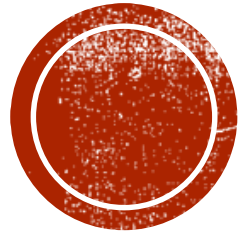
Assistant Professor, Department of Pediatrics, Section of Allergy and Immunology, University of Manitoba

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LEARNING OBJECTIVES



At the end of this session, participants will be able to:

- 1. Describe advances in the prevention of food allergy** and review recent guidelines to promote early food introduction
- 2. Integrate current best evidence** to address ongoing controversies around the timing of food introduction among infants
- 3. Support the dissemination of the early introduction of foods** in the prevention of food allergy





At the end of this session, participants will be able to:

1. Describe advances in the prevention of peanut allergy and review recent guidelines to promote early introduction of peanut
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EPIDEMIOLOGY



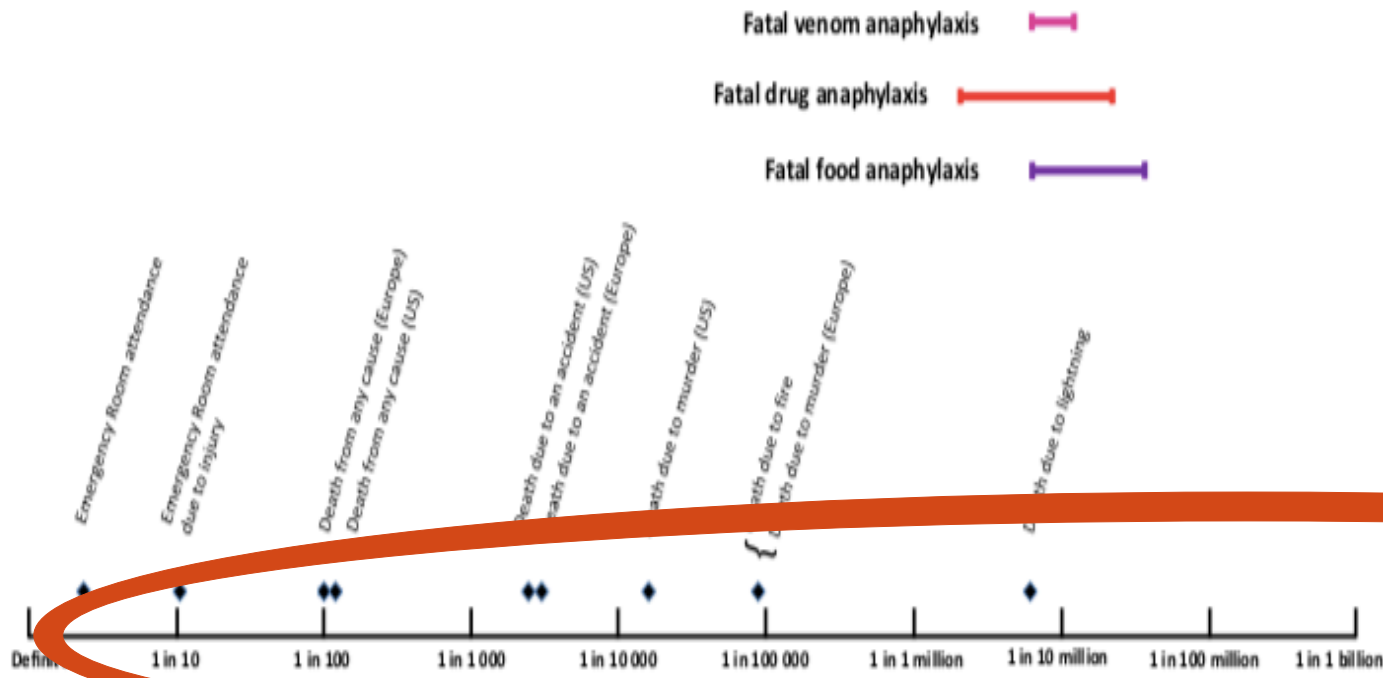
- **In Canada, 7% of children** are estimated to have food allergy



FOOD ALLERGY MORTALITY

SEPTEMBER/OCTOE

Annual incidence of fatal anaphylaxis in an unselected population



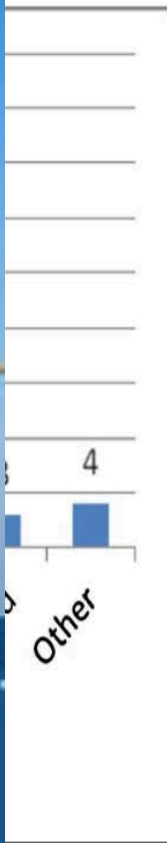
had asthma that was well controlled. All had known allergies. The reactions were to peanuts (four patients), which were contained in products such as candy, and occurred within minutes of the ingestion of the allergen, but only two patients within 5 minutes of allergen ingestion, and all reactions were as rapidly progressive and uniphasic in seven patients.

patients, 2 patients with a relatively symptom-free interval in three; and protracted in three, requiring intubation for 2-7 days.





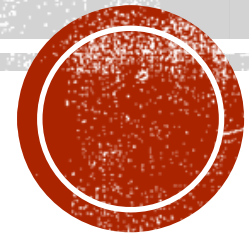
WITH FOOD



Primeau MN et al. *Clin Exp Allergy* 2000;30:1135-43
 Shemesh E et al. *Pediatrics* 2013;131:15-22
 Lebovidge JS et al. *J Allergy Clin Immunol* 2009;124:1282-8



**TAKE HOME POINT: FOOD ALLERGY HAS A
SIGNIFICANT IMPACT ON QUALITY OF LIFE AND
ITS PREVENTION IS A PUBLIC HEALTH GOAL**



THE SEA CHANGE IN FOOD ALLERGY PREVENTION GUIDELINES





WHERE IT ALL BEGAN

Food Allergen Avoidance in the Prevention of Food Allergy in Infants and Children

Robert S. Zeiger
Pediatrics 2003;111;1662

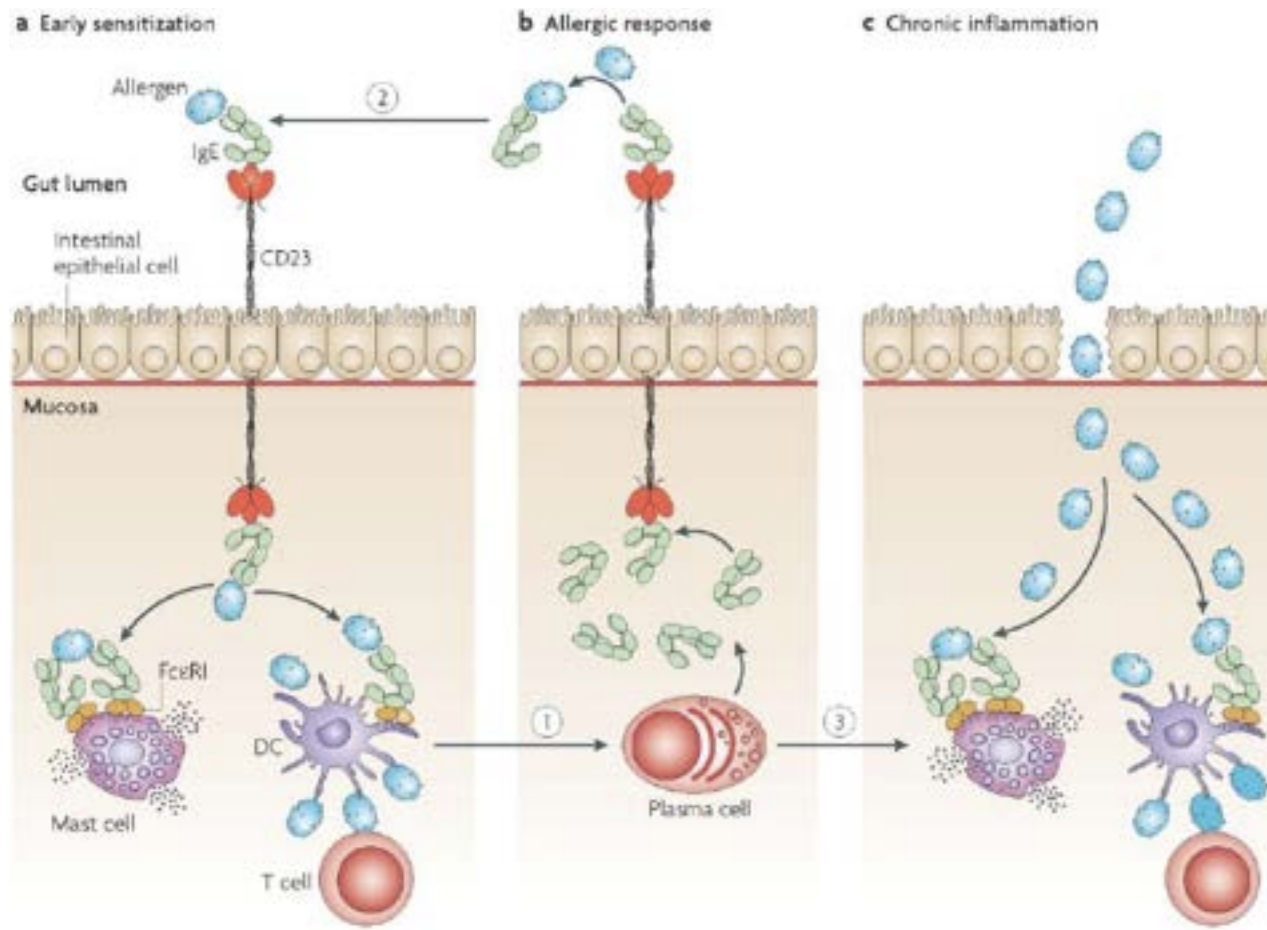
Delayed introduction of solid foods to infant

Start least allergenic at sixth month; CM at 12 mo; eggs at 24 mo; Peanuts, nuts, and fish at 36 mo

Start at fifth month of life

The less restrictive ESPACI recommendations are based on studies in which CMA was prevented even when CM was introduced at 5 mo. The AAP recommendation is based on consensus rather than on direct evidence.





Nature Reviews | Immunology





J Allergy Clin Immunol. 2007 May;119(5):1203-9. Epub 2007 Mar 26.

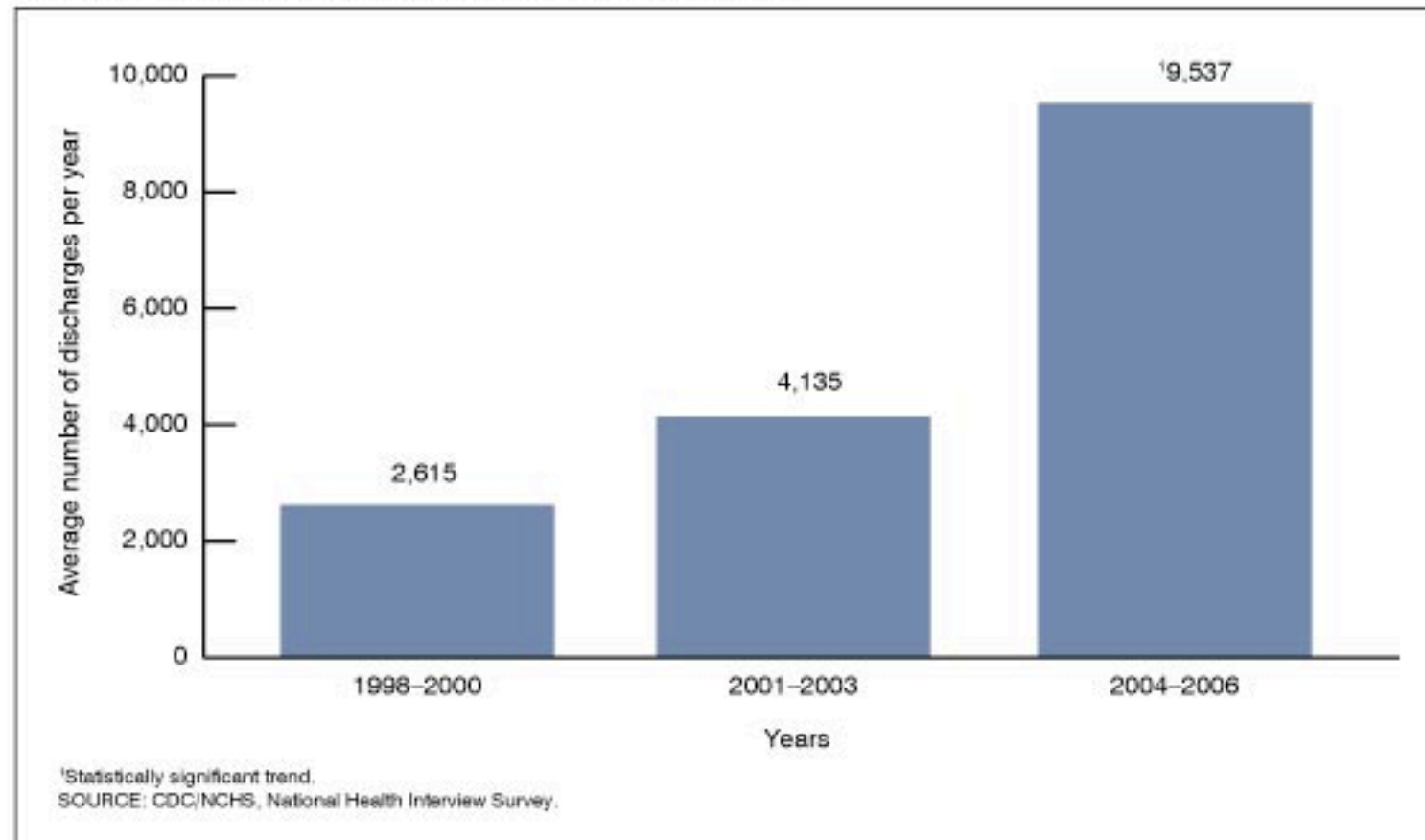
The risk of developing food allergy in premature or low-birth-weight children.

Liem JJ¹, Kozyrskyj AL, Huq SI, Becker AB.

 **Author information**



Figure 4. Average number of hospital discharges per year among children under age 18 years with any diagnosis related to food allergy: United States, 1998–2006





J Allergy Clin Immunol. 2008 Nov;122(5):9

Early consumption of peanuts and allergy.

Du Toit G¹, Katz Y, Sasieni P, Mesheri

1.00
0.75
0.50
0.25
0.00



Prevalence of peanut allergy.

n G, Cohen A, Livne I, Lack G.



EARLY EGG INTRODUCTION

Can early introduction of egg prevent egg allergy in infants? A population-based study

TABLE II. Association between infant dietary factors and egg allergy at 1 year of age

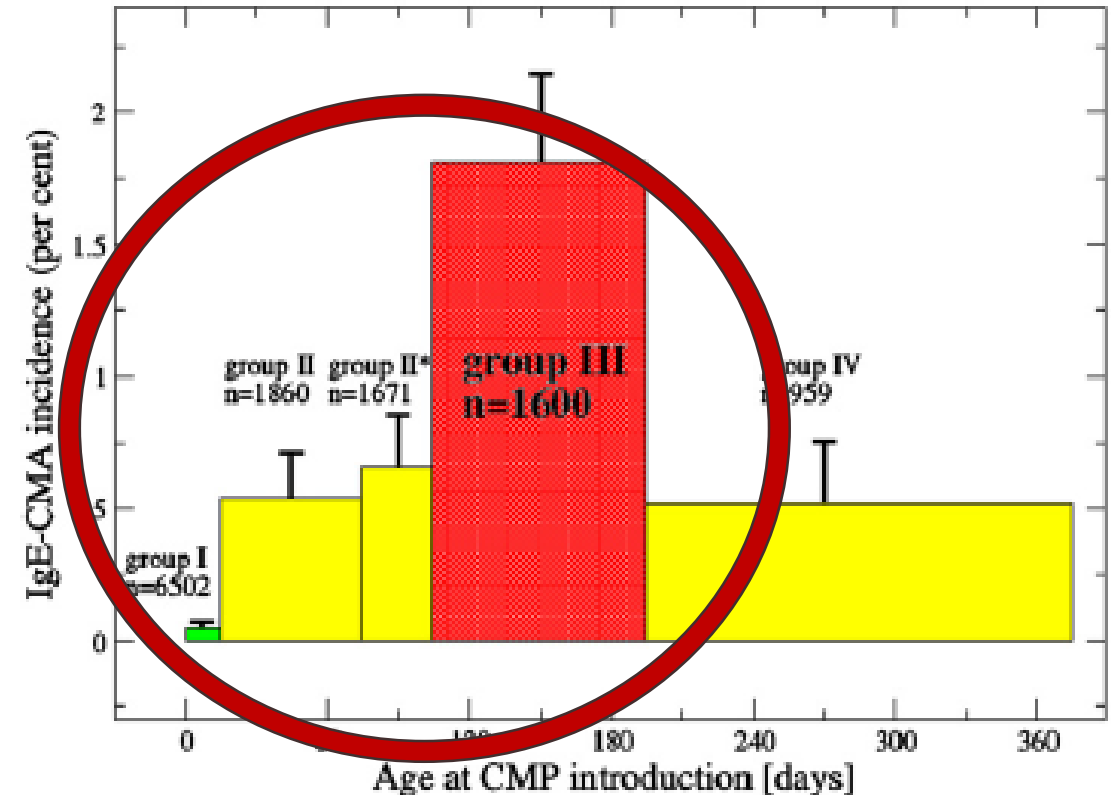
Variable	No.*	Egg allergy (%)	Unadjusted	
			OR (95% CI)	P value, trend
Age at introduction of egg (mo)†				
4-6	485	5.6	1.0	<.001
7-9	933	7.8	1.4 (0.9-2.3)	
10-12	730	10.1	1.9 (1.2-3.0)	
>12	98	27.6	6.5 (3.6-11.6)	

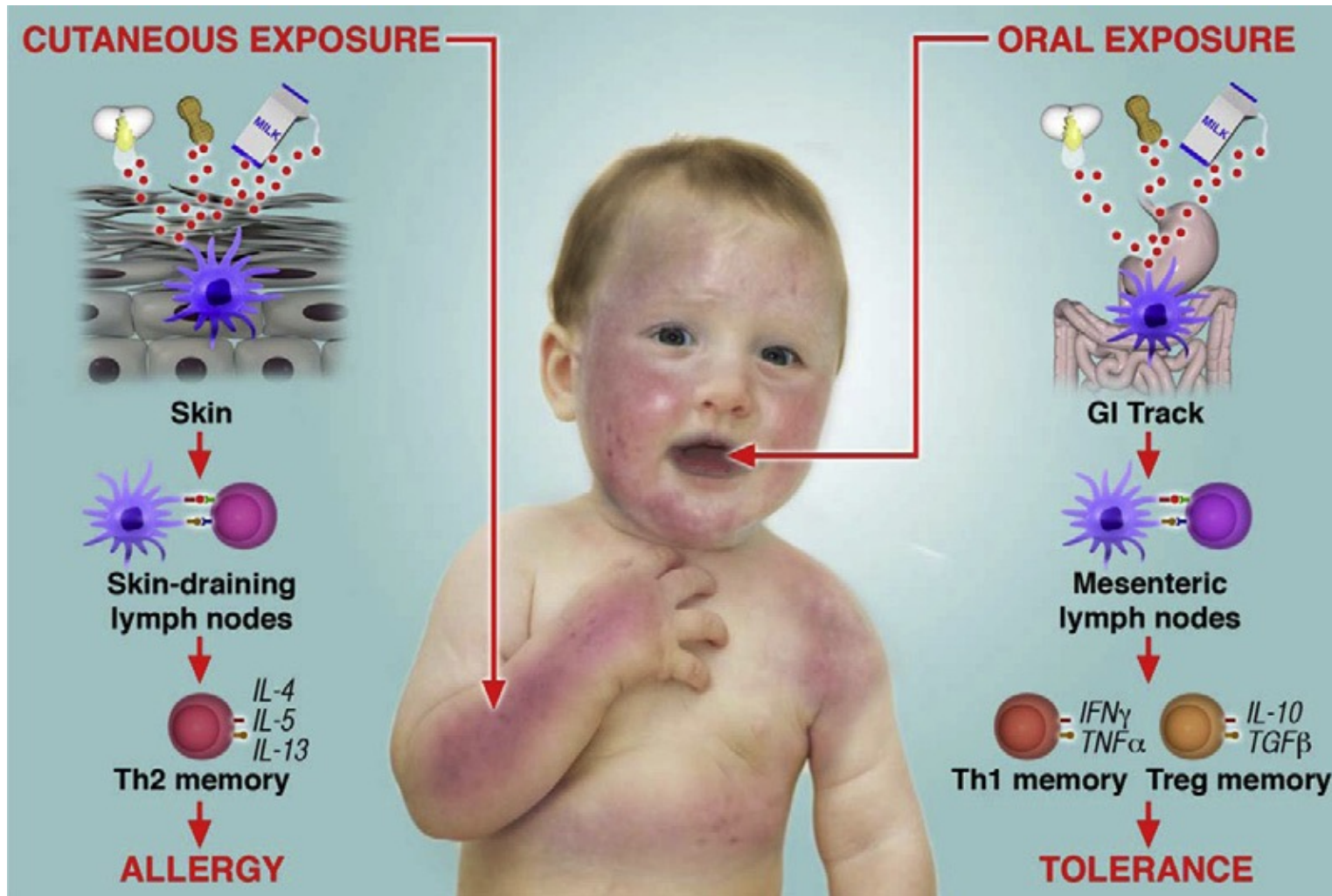


EARLY COWS MILK INTRODUCTION

Early exposure to cow's milk protein is protective against IgE-mediated cow's milk protein allergy

- OR 19.3 for development of cows milk allergy if regular exposure to cows milk at 15 days or more





CPS POSITION STATEMENT

Dietary exposures and allergy prevention in high-risk infants

A joint statement with the Canadian Society of Allergy and Clinical Immunology

Edmond S Chan, Carl Cummings; Canadian Paediatric Society, Community Paediatrics Committee and Allergy Section



Français en page 550



CPS POSITION STATEMENT (2013)

For high-risk infants*

- **Do not delay** the introduction of specific solid foods beyond 6 months. Later introduction does not prevent, and may in fact promote the development of food allergy
 - Regular ingestion of new foods several times a week is important to maintain tolerance

* high-risk= first degree relative with food allergy, atopic dermatitis, asthma or allergic rhinitis





STUDY: EATING PEANUTS COULD PREVENT ALLERGY



AT THIS HOUR





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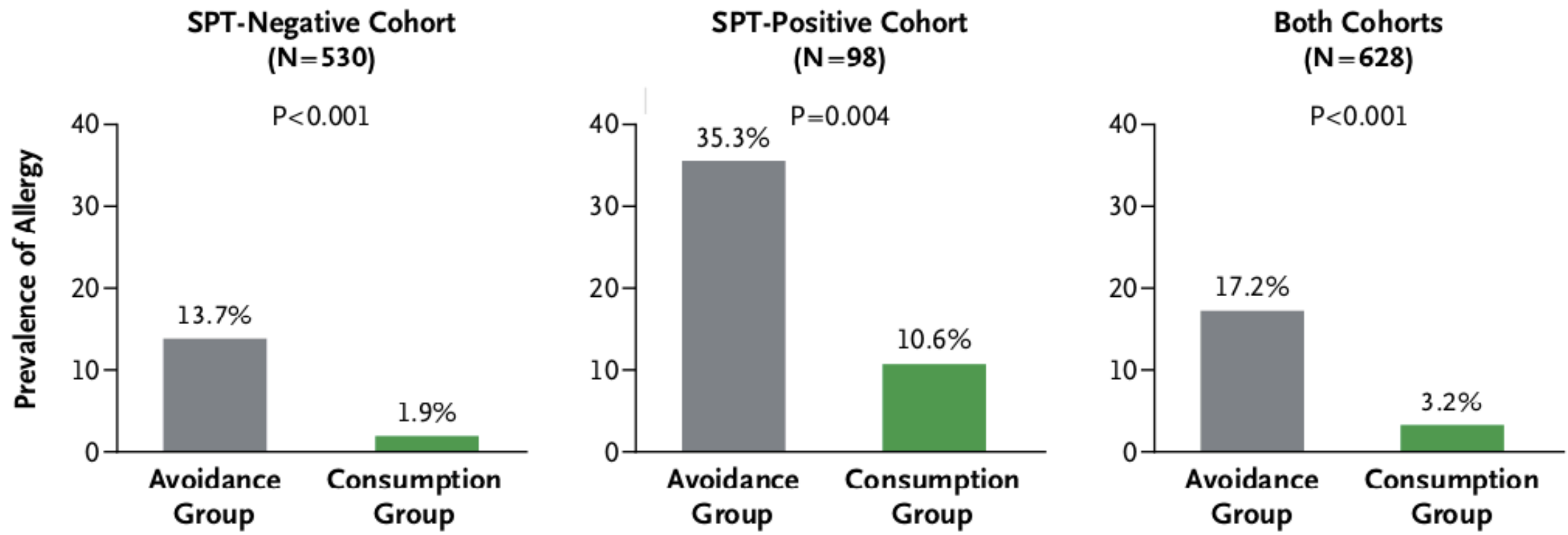
**Randomized Trial of Peanut Consumption
in Infants at Risk for Peanut Allergy**

George Du Toit, M.B., B.Ch., Graham Roberts, D.M., Peter H. Sayre, M.D., Ph.D., Henry T. Bahnson, M.P.H., Suzana Radulovic, M.D., Alexandra F. Santos, M.D., Helen A. Brough, M.B., B.S., Deborah Phippard, Ph.D., Monica Basting, M.A., Mary Feeney, M.Sc., R.D., Victor Turcanu, M.D., Ph.D., Michelle L. Sever, M.S.P.H., Ph.D., Margarita Gomez Lorenzo, M.D., Marshall Plaut, M.D., and Gideon Lack, M.B., B.Ch., for the LEAP Study Team*



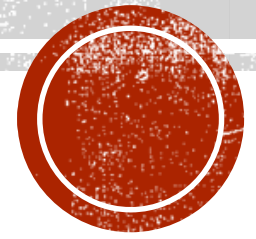


A Intention-to-Treat Analysis



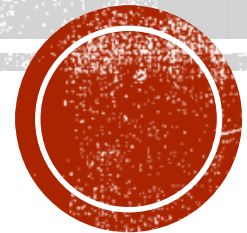


LIMITATIONS OF LEAP STUDY?



TAKE HOME POINT:

THE LEAP STUDY IS THE FIRST RCT TO SHOW
THAT INTRODUCTION OF PEANUT-CONTAINING
FOODS TO INFANTS AT HIGH RISK OF
DEVELOPING ALLERGY WAS SAFE



Food introduction and allergy prevention in infants

Elissa M. Abrams MD, Allan B. Becker MD

CMAJ Podcasts: author interview at <https://soundcloud.com/cmajpodcasts/150364-rev>

“If a family asks how to prevent food allergy in their children, our current advice is to introduce allergenic solids between 4-6 months of age...”



2017 NIAID GUIDELINES FOR THE PREVENTION OF PEANUT ALLERGY



Canadian Society of Allergy and Clinical Immunology
Société canadienne d'allergie et d'immunologie clinique



Summary of Addendum Guidelines

Addendum Guideline	Infant Criteria	Recommendations	Earliest Age of Peanut Introduction
1	Severe eczema, egg allergy, or both	Strongly consider evaluation with peanut-specific IgE and/or skin prick test and, if necessary, an oral food challenge. Based on test results, introduce peanut-containing foods.	4 to 6 months



Summary of Addendum Guidelines

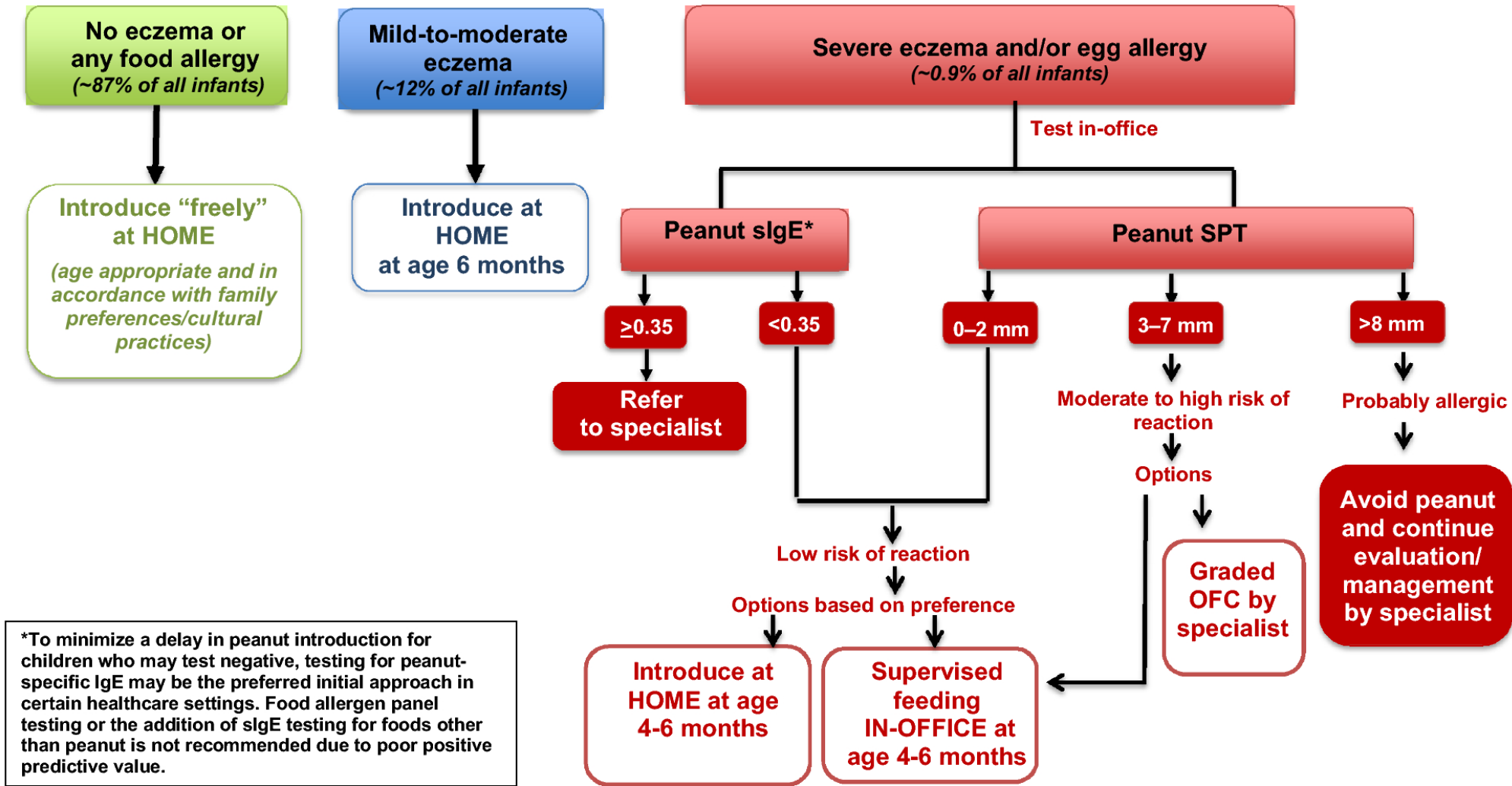
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2	Mild to moderate eczema	Introduce peanut-containing foods.	Around 6 months



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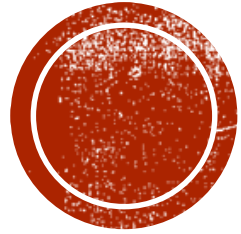
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2	Mild to moderate eczema	Introduce peanut-containing foods.	Around 6 months
3	No eczema or any food allergy	Introduce peanut-containing foods.	Age-appropriate and in accordance with family preferences and cultural practices





If tolerated, age-appropriate serving amounts of peanut to be consumed regularly (i.e., ≥ 3 times per week)





**WHAT ARE SOME OF THE BARRIERS
TO THE NIAID GUIDELINE
IMPLEMENTATION?**

APPLYING THE NIAID GUIDELINES

Hildebrand *et al.*
Allergy Asthma Clin Immunol (2017) 13:7
DOI 10.1186/s13223-017-0180-2

Allergy, Asthma & Clinical Immunology

LETTER TO THE EDITOR

Open Access



Primum non nocere—first do no harm. And then feed peanut

Kyla Jade Hildebrand^{1*}, Elissa Michele Abrams², Timothy K. Vander Leek³, Julia Elizabeth Mainwaring Upton⁴, Douglas P. Mack⁵, Linda Kirste⁶, Christine McCusker⁷ and Sandeep Kapur⁸



APPLYING THE NIAID GUIDELINES

- Early introduction is the primary goal



SCREENING HIGH RISK INFANTS

J Allergy Clin Immunol Pract. 2018 Aug 13. pii: S2213-2198(18)30507-5. doi: 10.1016/j.jaip.2018.07.035. [Epub ahead of print]

Knowledge gaps and barriers to early peanut introduction among allergists, pediatricians, and family physicians.

Abrams EM¹, Singer AG², Soller L³, Chan ES³.

Author information

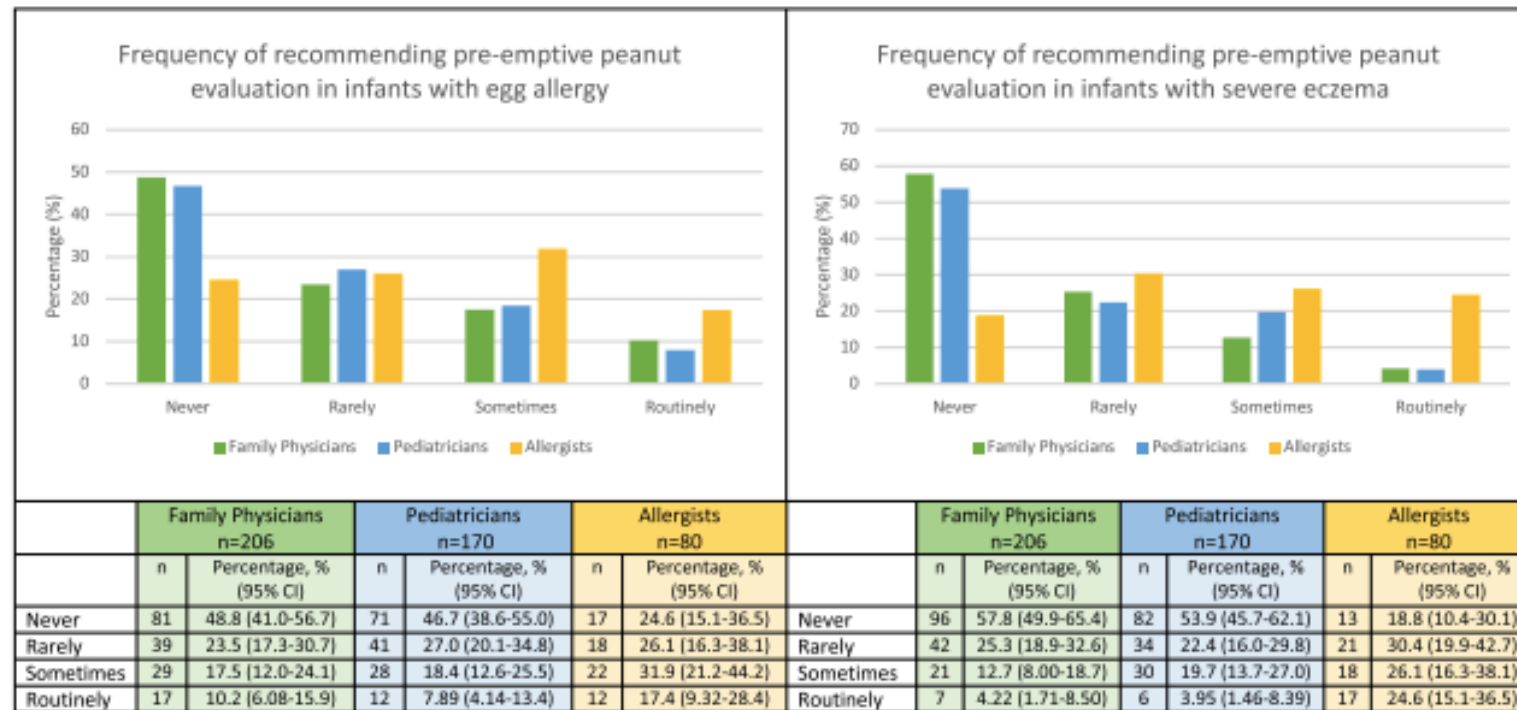
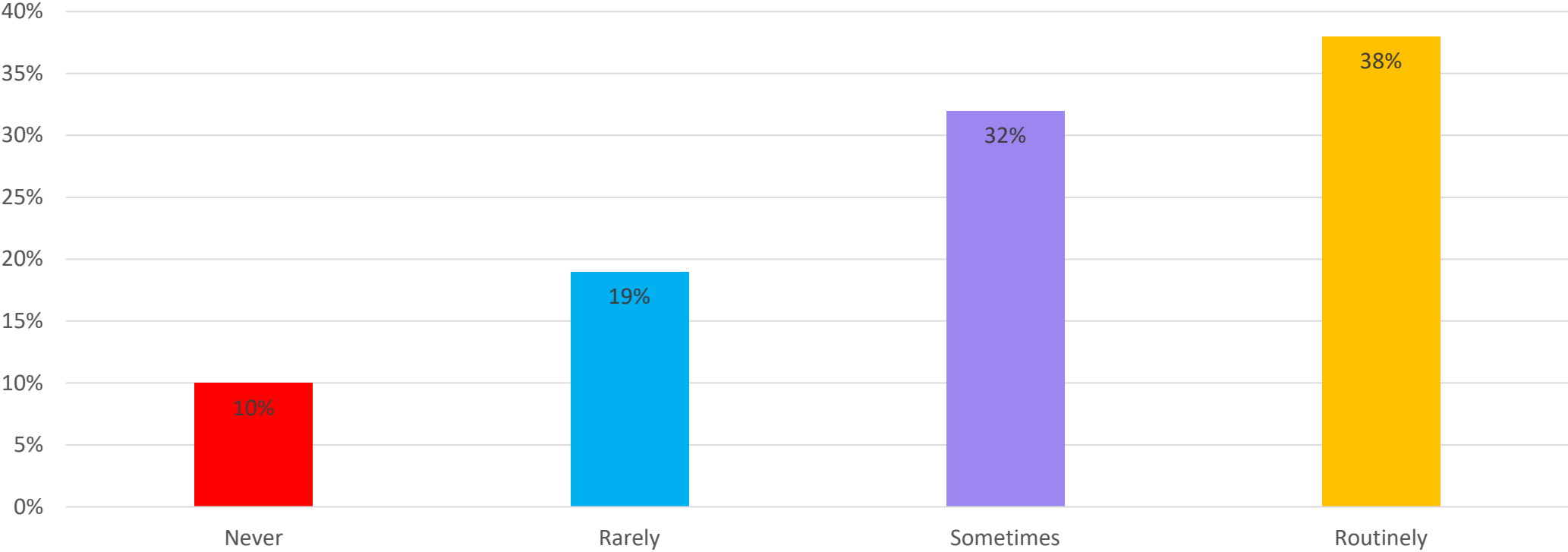


FIGURE 1. Frequency of recommending preemptive peanut evaluation before peanut introduction in high-risk infants.



SCREENING HIGH RISK INFANTS

Do you perform oral food challenges in infants?



Abrams EM et al. *J Allergy Clin Immunol* 2018 [epub ahead of print]





Potential Pitfalls in Applying Screening Criteria in Infants at Risk of Peanut Allergy

Elissa M. Abrams, MD, FRCPC¹, and Edmond S. Chan, MD, FRCPC, FAAAAI²

- How do you define high risk?
- How do you define severe eczema?
- Why limit early introduction to peanut?

TABLE III. What constitutes an infant at high risk for PA*

Risk factor	FPs		Pediatricians		Allergists	
	Frequency, n	% (95% CI)	Frequency, n	% (95% CI)	Frequency, n	% (95% CI)
First-degree relative with atopic disease/allergy	82	49.4 (41.6-57.3)	95	62.5 (54.3-70.2)	30	42.3 (30.6-54.6)
Any family history of atopic disease/allergy	26	15.7 (10.5-22.1)	24	15.8 (10.4-22.6)	4	5.6 (1.6-13.8)
Egg allergy	45	27.1 (20.5-34.5)	58	38.2 (30.4-46.4)	66	93.0 (84.3-97.7)
Severe eczema	87	52.4 (44.5-60.2)	104	68.4 (60.4-75.7)	69	97.2 (90.2-99.7)
Milk allergy	22	13.2 (8.50-19.4)	46	30.3 (23.1-38.2)	26	36.6 (25.5-48.9)
Sibling of peanut-allergic child	149	89.8 (84.1-93.9)	128	84.2 (77.4-89.6)	44	62.0 (49.7-73.2)
Parental peanut allergy	136	81.9 (75.2-87.5)	121	79.6 (72.3-85.7)	29	40.8 (29.3-53.2)
History of asthma	47	28.3 (21.6-35.8)	58	38.2 (30.4-46.4)	12	16.9 (9.0-27.7)
History of rhinitis	16	9.64 (5.61-15.2)	20	13.2 (8.23-19.6)	4	5.6 (1.6-13.8)
Other	9	5.42 (2.51-10.0)	4	2.63 (0.72-6.60)	5	7.0 (2.3-15.7)

*Multiple responses were allowed.





TAKE HOME POINT:

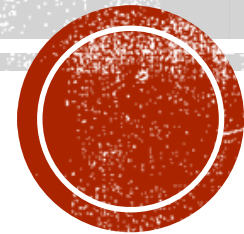
THE OVERWHELMING MAJORITY OF INFANTS
CAN INTRODUCE PEANUT EARLY AT HOME
WITHOUT INVESTIGATION





TAKE HOME POINT:

FEASIBILITY OF NIAID GUIDELINE
IMPLEMENTATION REQUIRES FURTHER
ASSESSMENT



Early Infant Feeding Guidelines FAQs

The new [Addendum Guidelines for the Prevention of Peanut Allergy](#) in the U.S. were released in January 2017. This report from the National Institute of Allergy and Infectious Diseases (NIAID) represents a dramatic shift from previous advice to parents and caregivers regarding the introduction of peanut in a child's diet.

The Canadian Society of Allergy and Clinical Immunology (CSACI) and Food Allergy Canada have compiled this list of FAQs from the most common questions parents asked about these guidelines. These questions are answered by Canadian Pediatric Allergists Dr. Elissa M. Abrams and Dr. Kyla J. Hildebrand. We hope you find these FAQs helpful and informative.

As always, we advise parents to speak with their physician if they have any concerns.

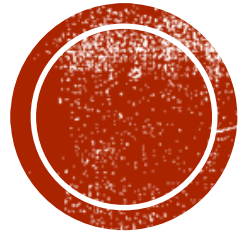


10. How do you know your child is egg allergic if they haven't eaten egg yet at 4 months? Do they need testing to egg, or to eat egg, before eating peanut?

Allergic symptoms to egg include rash, swelling, vomiting, or breathing problems after eating egg products. In the NIAID guidelines, egg allergy is defined as having a history of reacting to egg and either a positive scratch test to egg or a reaction to egg on an observed feed at an allergist's office.

Your child does not need to eat egg before eating peanut. However, if your child is known to be allergic to egg, or has had allergic symptoms with egg, they should be evaluated before eating peanut.





WHAT ABOUT EARLY INTRODUCTION OF ALLERGENIC FOODS OTHER THAN PEANUT?

SOME OTHER STUDIES OF EARLY EGG INTRODUCTION

Trial Name	Study Design	Outcome
BEAT	319 infants with family history of atopy introduced to pasteurized whole egg powder at 4 months vs. avoidance until 8 months	Decreased egg sensitization (11% vs 20%; P=.03); N/S decrease in probable egg allergy
HEAP	406 general risk infants introduced to pasteurized egg white powder at 4-6 months vs. avoidance until 12 months	No difference in risk of egg allergy or egg sensitization
PETIT	121 infants with eczema introduced to cooked egg at 6 months versus avoidance until a year of age	Significantly lower risk of egg allergy with early introduction (8% vs 38%; P=.0001)
STAR	86 infants with moderate to severe eczema introduced to pasteurized raw egg powder at 4 months vs. avoidance until 8 months	N/S decrease in egg allergy at a year of age (33% vs 51%; P=0.11); high rate of reactions (31%)
STEP	820 infants with maternal eczema introduced to pasteurized raw egg powder at 4-6.5 months vs. avoidance until 10 months	N/S decrease in egg allergy at a year of age (7% vs 10%; P=0.2); decreased egg sensitization

Natsume O, Kabashima S, Nakasato J et al. *Lancet* 2016;389:276-86
 Wei-Liang Tan J, Valerio O, Barnes EH et al. *J Allergy Clin Immunol* 2017;139:1621-8
 Palmer DJ, Metcalfe J, Makrides M et al. *J Allergy Clin Immunol* 2013;132:387-92
 Palmer DJ, Sullivan TR, Gold MS et al. *J Allergy Clin Immunol* 2017;139:1600-7
 Bellach J, Schwarz V, Ahrens B et al. *J Allergy Clin Immunol* 2017;139:1591-9



The Association of the Delayed Introduction of Cow's Milk with IgE-Mediated Cow's Milk Allergies

- Case-control study comparing children with IgE-mediated cow's milk allergy to controls and children with egg allergy
- Conclusion: early, regular, consistent cow's milk exposure associated with lower risk of cow's milk allergy**

TABLE III. Multivariable logistic regression analysis for IgE-CMA according to feeding patterns adjusted by variables of allergic symptoms, parental age at delivery, and family history of allergy

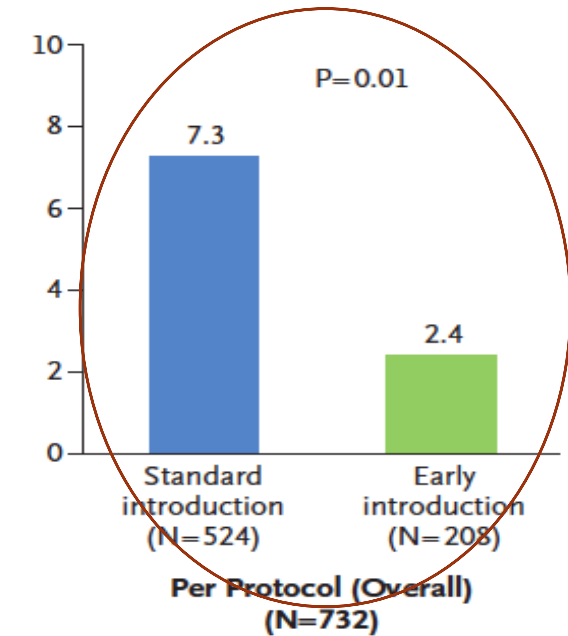
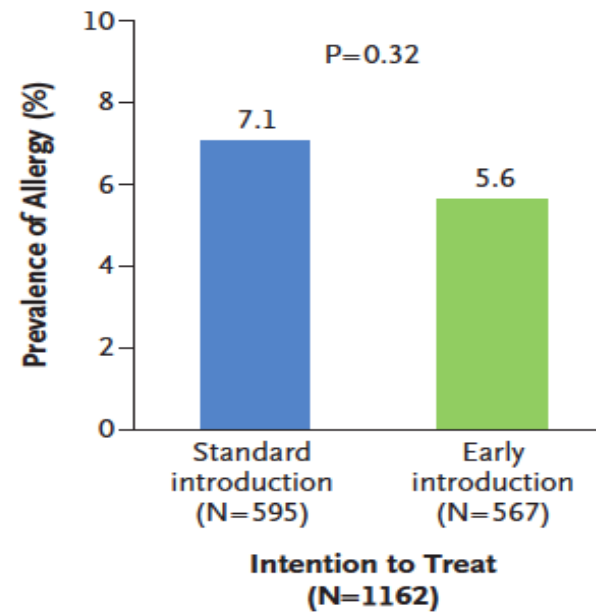
	CMA vs Control					
	cOR	95% CI	P value	aOR	95% CI	P value
Delayed* or no regular CM formula	10.71	4.19-27.39	<.001	23.74	5.39-104.52	<.001
No early regular continuous† CM formula	25.48	5.88-110.40	<.001	92.76	9.05-951.04	<.001
	CMA vs EA					
	cOR	95% CI	P value	aOR	95% CI	P value
Delayed* or no regular CM formula	5.83	1.94-17.55	.001	10.16	2.48-41.64	.001
No early regular continuous† CM formula	12.83	2.61-63.00	<.001	21.58	3.33-139.95	.001



Randomized Trial of Introduction of Allergenic Foods in Breast-Fed Infants

- Poor compliance with study protocol
- No reduction in food allergy in ITT analysis

A One or More Foods

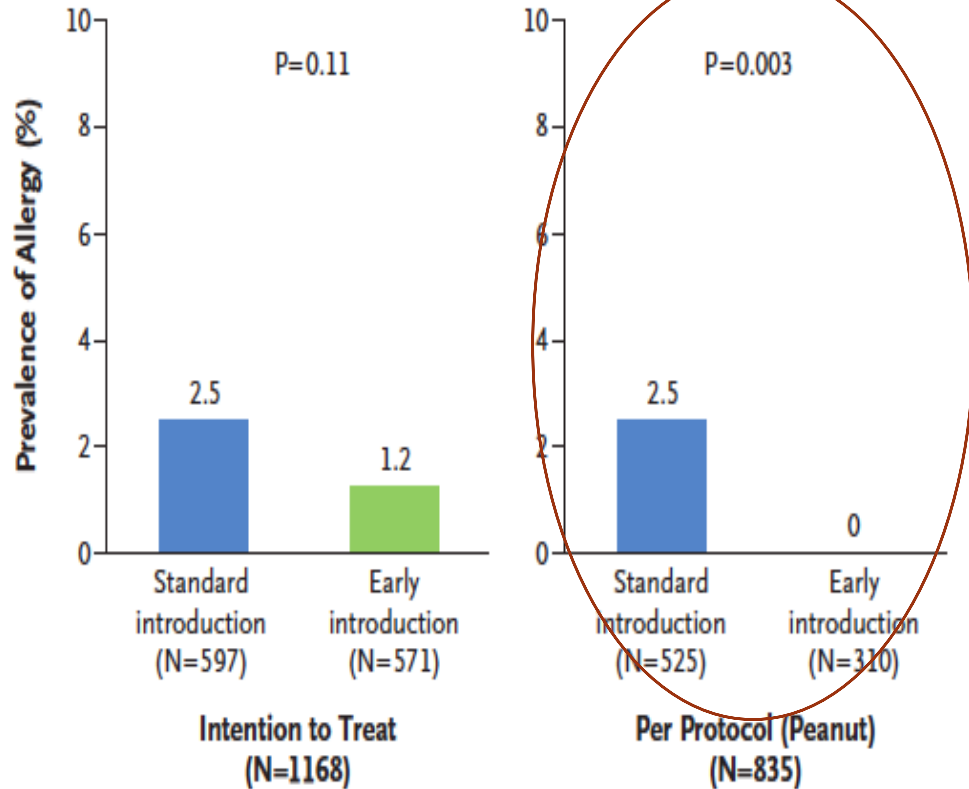


Perkin MR, Logan K, Tseng A et al. *NEJM* 2016;374:1733-43

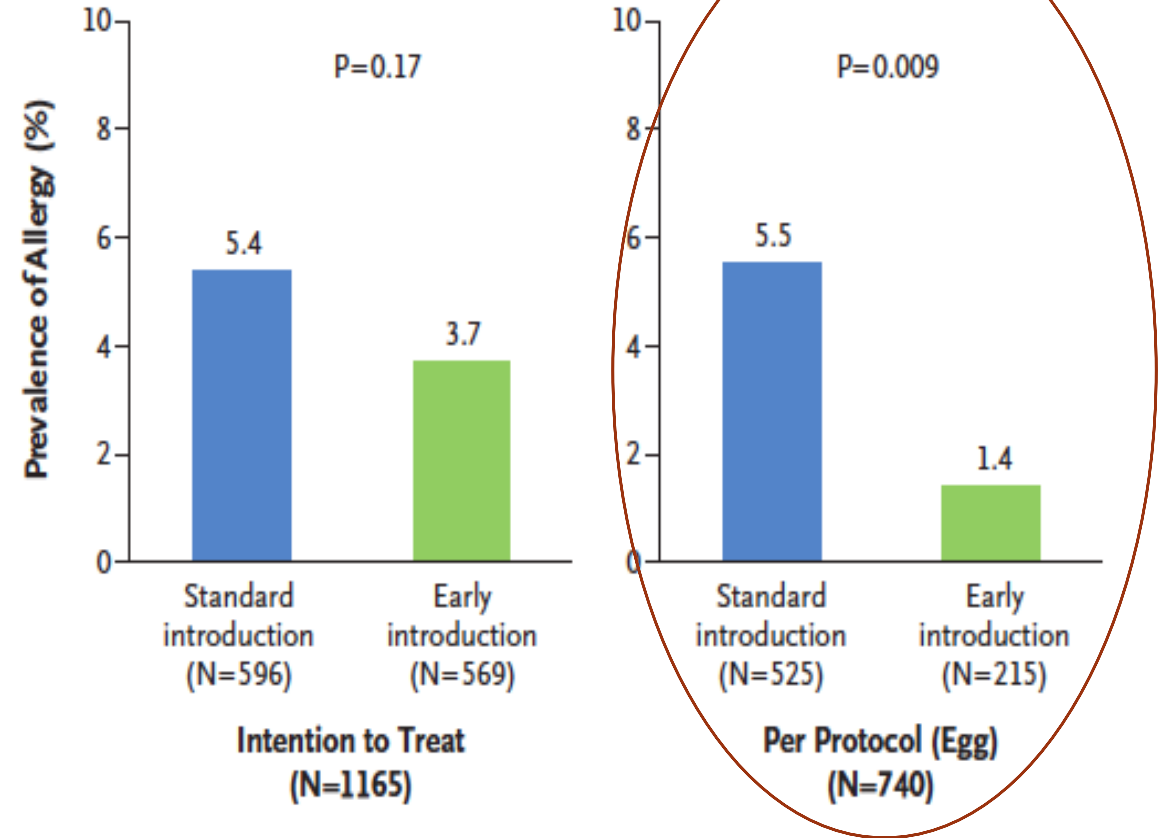


EAT STUDY RESULTS - PEANUT AND EGG

B Peanut



C Egg





Timing of Allergenic Food Introduction to the Infant Diet and Risk of Allergic or Autoimmune Disease

A Systematic Review and Meta-analysis

- Moderate certainty evidence that **early egg introduction** at 4-6 months reduces the risk of egg allergy
- Moderate certainty evidence that **early peanut introduction** at 4-11 months reduces the risk of peanut allergy

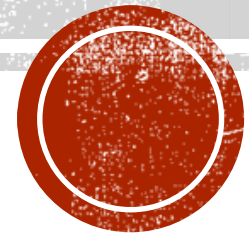




TAKE HOME POINTS:

THERE IS NOW MODERATE EVIDENCE FOR INTRODUCTION OF EGG AT 4-6 MONTHS. HOW EGG IS INTRODUCED AFFECTS TOLERABILITY.

EARLY REGULAR COW'S MILK INTRODUCTION, ESPECIALLY WITH ONGOING BREASTFEEDING, MAY HAVE A PROTECTIVE EFFECT BUT MORE STUDIES ARE REQUIRED.



UPCOMING CPS PRACTICE POINT RECOMMENDATIONS

- Allergenic solids be introduced into diet “**at around six months but not before four months**” of age, while continuing to breastfeed
- Once introduced, if tolerated, regular exposure to the allergenic food is important for maintenance of tolerance





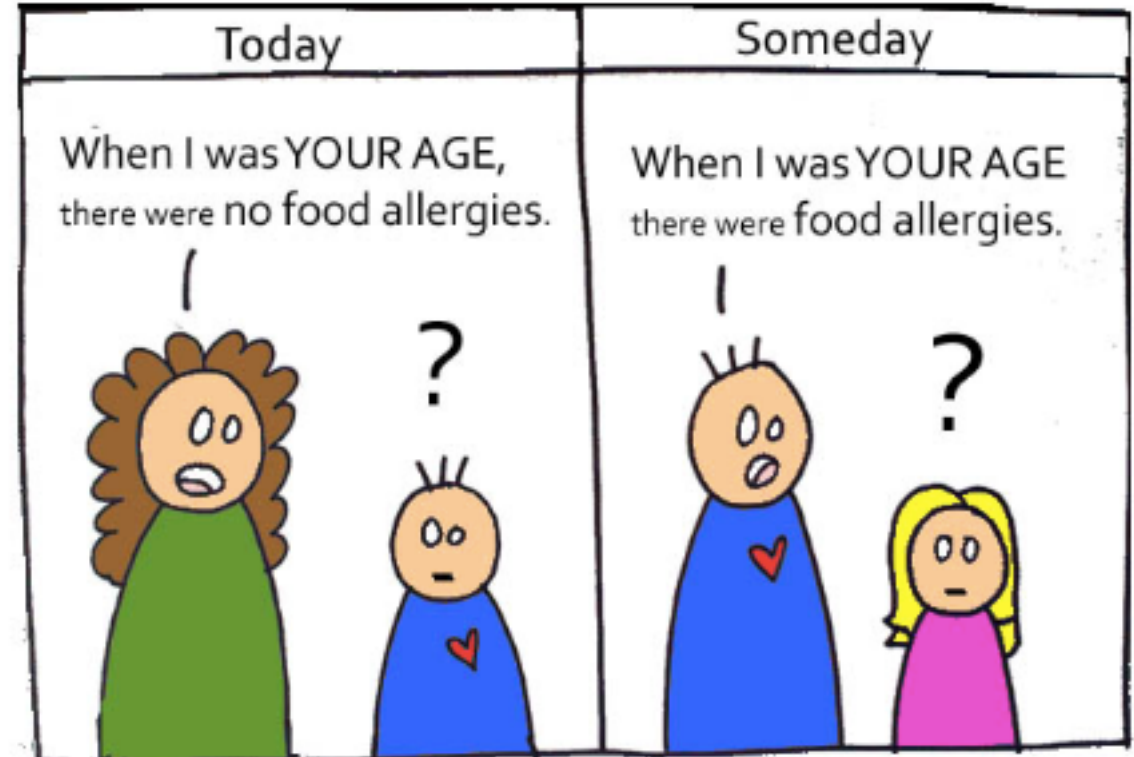
- Introduce allergenic foods in high risk infants “at around 6 months but not before 4 months of age”



IN SUMMARY

- The majority of infants can introduce peanut at home
- There are significant limitations to pre-emptive peanut testing
- Other foods such as egg, and milk have emerging evidence for the benefits of early introduction

Food Allergy Fun



www.foodallergyfun.com

TGF 2001





Participants can now:

1. Describe **advances in the prevention of peanut allergy** and implement guideline recommendations to promote early introduction of peanut
2. **Integrate current best evidence** to address parent questions surrounding controversies around the timing of food introduction among infants
3. **Disseminate knowledge of early introduction of foods** in the prevention of food allergy to pediatricians



ACKNOWLEDGEMENTS



- Dr. L. Long
- Dr. A. Becker
- Dr. E. Chan
- Dr. S. Sicherer
- (Future MD) A. Geist
- Ms. M. Morgan



QUESTIONS?

