

Literature Review

(and random stuff 😊)

Tom Chacko

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Atlanta Area



- Been doing OIT since about 2015

- 3 doctors with me (all 3 about 4 years out of fellowship from food allergy centers)

- High volume- See about 10-15+ new second opinion/food allergy cases weekly

- Most published case presentations in the food allergy space

- On Instagram 😊

- Data, experience, how we implement in our practice

Oral Food Challenges After Treatment With Omalizumab in the Clinical Setting

JACI in Practice

May 2026

Hao Tseng, MD, MSc, Robert A. Wood, MD, Jackie Isola, RN, MS, CPNP, Nicholas Anania, BA, and Jennifer Dantzer, MD, MHS *Baltimore, Md*

VISUAL SUMMARY

Oral Food Challenges After Treatment with Omalizumab in the Clinical Setting

OBJECTIVE

- To examine the oral food challenge (OFC) outcomes after treatment with omalizumab for food allergy (FA) in the clinical setting.

METHODS

Johns Hopkins pediatric allergy clinic

Patients who initiated omalizumab for FA between February 2024 and February 2025

and

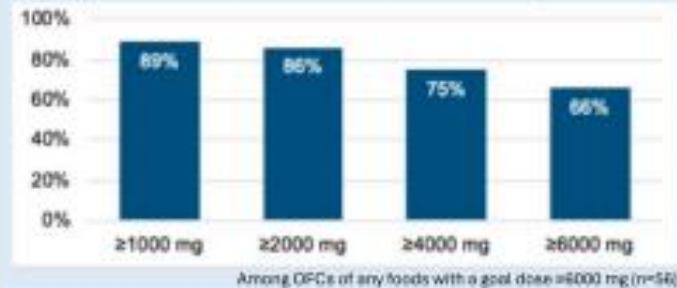
Underwent open OFCs through August 2025

Retrospective chart review

RESULTS

- A total of 51 patients, median age 9 (range 1-23) years, underwent 73 OFCs, mostly to milk, egg, and wheat.

Percentage of OFCs that successfully reached different specified cumulative tolerated dose of food protein



Treatment response was associated with:

- Higher baseline total IgE
- Higher omalizumab dose per 4-weeks per weight
- Q2 versus q4 week dosing
- Lower allergen-specific IgE to total IgE ratio



Allergic reactions occurred in 45% of OFCs and were mostly mild. Two patients required epinephrine



Dietary introduction of allergenic foods was permitted at specified amounts following 92% of OFCs

Omalizumab can be effectively used for the treatment of food allergy in the clinical setting and may enable the introduction of allergenic foods into the diet for many patients

-Retrospective out of Hopkins over 1 year

- 51 patients- most very allergic to milk, egg, some wheat

- At least 4 months Xolair prior

- Most had Xolair for about 7 months

- About 90% tolerated a gram of protein

- More Xolair they gave, seems to work better

Long-term comparison of high- and low-dose oral immunotherapy in children with anaphylactic cow's milk allergy

Yu Ito ^{1 2}, Ken-Ichi Nagakura ^{1 3}, Sakura Sato ¹, Motohiro Ebisawa ^{1 2}, Noriyuki Yanagida ¹

Affiliations + expand

PMID: 39891491 DOI: 10.1111/pai.70033

Pediatric Allergy and
Immunology, Feb 2025

Abstract

Background: Long-term evidence on maintenance doses of oral immunotherapy (OIT) for anaphylactic cow's milk allergy is insufficient.

Methods: We retrospectively compared the three-year safety, efficacy, and adherence between OIT with a maintenance dose of 200 mL of cow's milk (HOIT, 2009-2013) and 3 mL of cow's milk (LOIT, 2013-2019). Patients aged 6-18 years with a history of anaphylaxis reacting to ≤ 3 mL of cow's milk during oral food challenge (OFC) were included. Adverse symptoms, OFC negative rate after 2 weeks of avoidance, dropout rate, and immunological changes were compared.

Results: The median ages in the HOIT (n = 78) and LOIT (n = 99) groups were 8.1 and 7.8 years, with milk-specific IgE levels of 56.5 and 49.2 kUA/L, respectively. The percentages of doses triggering symptoms were 20.88%, 13.73%, and 7.31% in the HOIT group and 11.81%, 8.15%, and 6.30% in the LOIT group during years 1, 2, and 3, respectively. After 3 years, 29% of patients in the HOIT group passed the OFC with 200 mL, and 47%, 18%, and 5% of patients in the LOIT group passed the OFC with ≥ 25 mL, ≥ 50 mL, and 100 mL of cow's milk, respectively. After 3 years, the dropout rates were 24% and 11% in the HOIT and LOIT groups and milk-specific IgE levels decreased by 88% and 78% in the HOIT and LOIT groups, respectively.

Conclusion: HOIT enables higher dose consumptions. LOIT might be safer and have higher adherence in patients with anaphylactic cow's milk allergy.

Keywords: anaphylaxis; comparison; cow's milk allergy; long-term; maintenance dose; oral immunotherapy; protocols.

After 3 years of 3 ml of milk, 47% passed OFC of >25 ml of milk, 18% > 50 ml, 5% >100 ml

- 100 mg protein (3ml) versus 6600mg (200ml)

Randomized Trial of Milk Oral Immunotherapy: Fixed Low-Dose vs Escalation to Medium-Dose

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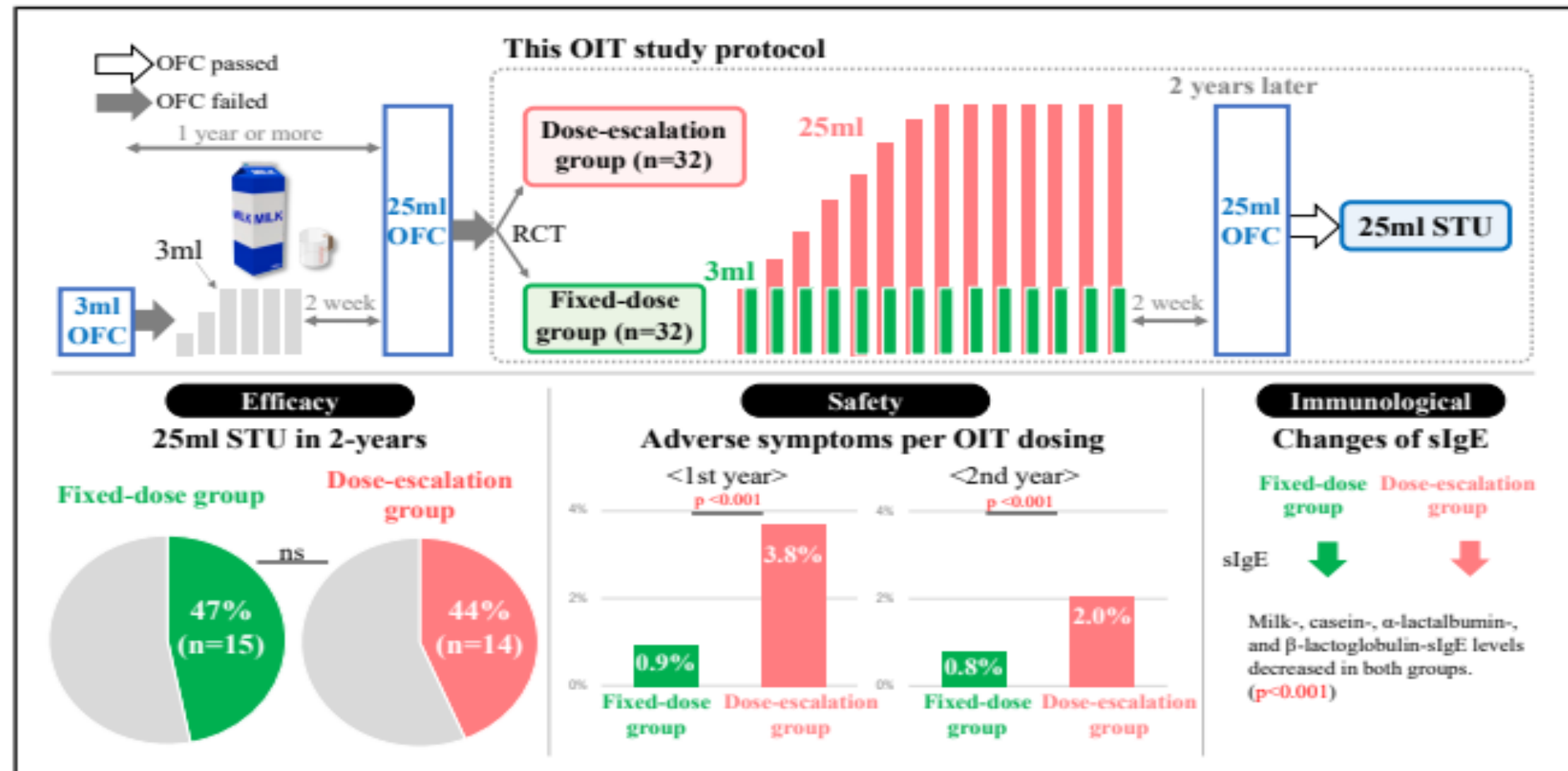
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TABLE E1. Oral immunotherapy dose

Step	1	2	3	4	5	6	7	8	9	10	11	12	13
Milk dose (mL)	3	3.5	4	5	6	7	8	10	12	14	17	20	25

In the dose-escalation group, participants proceed to the next-step dose if they remain asymptomatic for 7 d.

VISUAL SUMMARY



-Failed 3 ml challenge on entry

- 3 ml (99mg protein) vs 25 ml milk (825 mg)

- 25 MLs over 13 weeks at home

- 99% vs 94% did fine

Home multfood oral immunotherapy microdosing with Dartmouth Spoon Sheets



Sarah Hughes, MPAS, PA-C^{a,b},

Karen S. Hsu Blatman, MD, MBA^{a,b},

Brinda Prasanna Kumar, MD^{a,b}, and

Marcus S. Shaker, MD, MS, FAAP, FACAAI, FAAAAI^{a,b}

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Clinical Implications

Multifood oral immunotherapy using Dartmouth Spoon Sheets with microspoons and small home-dose escalations can be a safe and effective treatment option.

- Using dosing at home with microspoons
- Virtual visit with PA q 6-8 weeks
- Peanut (57%), TN (34%), milk (16%), egg (26%)
- Goal 300-400mg as maintenance
- Home OIT with DSS versus larger incremental doses every 2 weeks at home
- Makes sense, seems like would work

Spoon Sheet 1: Starting out... Black spoon!



Measure one level "Black (6-10 mg) SuperDosing Static-Free Micro Spoon" of "PB2 Original Powdered Peanut Butter" and Mix well into 3 oz of Apple Sauce
MIX, MIX, MIX!



On day...	Give this amount of apple sauce-peanut mixture...	✓	Date/Time/Notes
1	5 mL	☐	
2	10 mL	☐	
3	15 mL	☐	
4	20 mL	☐	
5	25 mL	☐	
6	30 mL (1 oz)	☐	
7	1 oz (oz) + 5 mL	☐	
8	1 oz + 10 mL	☐	
9	1 oz + 15 mL	☐	
10	1 oz + 20 mL	☐	
11	1 oz + 25 mL	☐	
12	1 oz + 30 mL	☐	

5 year old avoids all forms milk and egg (as well as PN,TN). Total IgE 670. Milk IgE 80. Casein 50. Egg IgE >100. Ovomucoid >100.

A.SLIT

B.OIT

C.Xolair

D.Xolair with OIT

E. Do nothing

- For SLIT Milk and Egg: When they challenge the baked milk or baked egg, do you do the 2 egg muffin and 1 1/3 dried milk powder recipes, or do you do a lower amount?

Baked egg- About 500-600 mg egg protein (about 4-5 ml egg white liquid)

Baked milk- 30 ml milk- (about 33 mg/ml)- about 900 mg protein

Infant and Toddler Peanut Oral Immunotherapy: Initiation Before Age 2 Increases *Ad Libitum* Peanut Consumption

JACI in Practice April 2025

S. Shahzad Mustafa, MD^{a,b}, Peter Capucilli, MD^{a,b}, Linh-An Tuong, MD, MSc^a, Denise Sanchez-Tejera, MD^a, Karthik Vadamalai, MD^{c,d}, and Allison Ramsey, MD^{a,b} Rochester, NY; and Houston, Texas

TABLE II. Protocol for peanut oral immunotherapy

Visit	Measuring spoon	Peanut protein (mg) PB2 powder	Approximate numbers of Peanuts
1	Black spoon	2	Fraction
	Red spoon	3	Fraction
	Mustard spoon	6	Fraction
2	1/64 tsp	16	Fraction
3	1/32 tsp	31	Fraction
4	1/16 tsp	63	1/4
5	1/32 tsp + 1/16 tsp	94	1/3
6	1/8 tsp	125	1/2
7	1/4 tsp	250	1
8	1/2 tsp	500	2
9	1/2 tsp + 1/4 tsp	750	3
10	1 tsp	1000	4
11	1 tsp + 1/2 tsp	1500	6
12	2 tsp	2000	8
13	2 tsp + 1/2 tsp	2500	10
14	1 tbsp	3000	12

Consumption of 1 tbsp of PB2 powder + *ad lib* consumption at least 2× weekly for 2 weeks.

Discontinue PB2 powder and continue with *ad lib* peanut consumption at least 2× weekly.

Visits will be scheduled every 2 weeks

TABLE I. Infant peanut food challenge protocol

Step	Measuring spoon (teaspoon)	Peanut protein (mg) PB2 powder	Approximate number of peanuts
1	1/32	31	Fraction
2	1/8	125	1/2
3	1/2	500	2
4	2	2000	8

- 6 mo to 4yo
- Goal 3000 mg protein
- 60 children- median age 16 mo
- 10% discontinue- adverse events or inability to consume
- 85% completed (median 7 months)
- Conclusion: Infant/toddler high dose POIT well tolerated and can lead to *ad lib* “free eating,” especially if started before 2 yo.

Makes sense 😊

Safety and Feasibility of Peanut, Tree Nut, and Sesame Oral Immunotherapy in Infants and Toddlers in a Real-World Setting

JACI in Practice Jan2025



Jenny Huang, MD^a, Leah H. Puglisi, MS^b, Kevin A. Cook, MD^a, John M. Kelso, MD^a, and Hannah Wangberg, MD^a San Diego, Calif

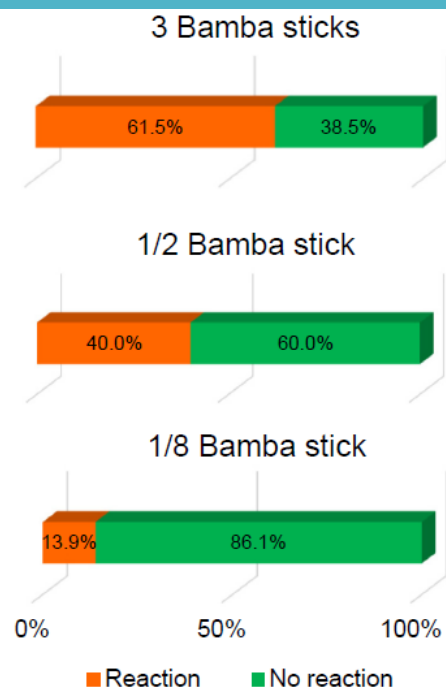


FIGURE 1. Bamba stick tolerance in peanut-allergic infants and toddlers during initial OFC. This figure assumes that 1 Bamba stick is approximately 100 mg peanut protein.

- 52 patients - 24 mo and younger
- 84% single food
- 48 patients PN (92%)
- Peanut mean IgE 4.75
- Cashew (9 patients) mean IgE 6.2
- 73% updosed at home

CONCLUSIONS: OIT in infants is safe and feasible to perform in a real-world setting using commercially available food products with at-home up dosing, thus increasing the availability of OIT for patients. © 2024 American Academy of Allergy,

varied, and higher eliciting doses were observed for peanut (144.8 mg peanut protein) compared with cashew (1 mg cashew protein) (Table III). Most subjects (86.1%) tolerated 1/8 of 1 Bamba stick (~12.5 mg peanut protein) on initial OFC with no reaction (Figure 1).

Food item	Amount	nut protein (mg)	Timing (dose escalation desired)*	desired)
Bamba puffs (sticks only, not the rings)	1/8 of 1 puff	12.5 [†]	Observe 30 min and if no reaction, advance to next dose	Observe for at least 60 min before sending home
	1/4 of 1 puff	25	Observe 30 min and if no reaction, advance to next dose	
	1/2 of 1 puff	50	Observe 30 min and if no reaction, advance to next dose	
	1 puff	100	Observe 30 min and if no reaction, advance to next dose	
	2 puffs	200	Observe 30 min and if no reaction, advance to next dose	
	4 puffs	400	Observe 30 min and if no reaction, advance to next dose	
	8 puffs [‡]	800	Continue advancing or can stop and wait at least 60 min before sending home [‡]	

*Dose escalations during initial OFC should be approached with careful consideration of the pros/cons of dose advancement on a case-by-case basis.

[†]If a patient was believed to have previously reacted to very trace amounts of peanut protein, the provider has the option of starting the OFC with a lower starting dose using weighed peanut flour, or (depending on the child's other food allergies) 1/8 of a Mission MightyMe multinut puff. However, we have found that most peanut-allergic children younger than 24 months tolerate a starting dose of 1/8 of 1 Bamba stick.

[‡]Realistically, infants and toddlers may not be willing to continue dose escalations to a full serving of 21 Bamba in 1 food challenge done in this manner and/or time is often a limiting factor. Thus, if an infant makes it to 8-10 puffs with no reaction, the provider may consider recommending continued home dose escalations over the next few weeks eventually to a full serving of Bamba after which parents should be advised to continue peanut protein ingestion at least once per week with the goal of peanut allergy prevention because this may be a child who is sensitized but not clinically allergic. If an allergic reaction occurs at home with this approach (suggestive of a very high threshold peanut allergy), the provider may transition to OIT with daily doses. If parents or providers are not comfortable with continued home dose escalations, they may schedule another food challenge to expose the child to higher doses of peanut protein in a supervised setting.

TABLE E2. Sample TN initial OFC for OIT-EFA

Food item	Amount	Approximate nut protein, per nut (mg)	Timing (dose escalation desired)*	Timing (no dose escalation desired)
Mission MightyMe multinut butter puffs [†]	1/8 of 1 puff	<1	Observe 30 min and if no reaction, advance to next dose	Observe for at least 60 min before sending home
	1/4 of 1 puff	1.125	Observe 30 min and if no reaction, advance to next dose	
	1/2 of 1 puff	2.25	Observe 30 min and if no reaction, advance to next dose	
	1 puff	4.5	Observe 30 min and if no reaction, advance to next dose	
	2 puffs	9	Observe 30 min and if no reaction, advance to next dose	
	4 puffs	18	Observe 30 min and if no reaction, advance to next dose	
	8 puffs [‡]	36	Continue advancing (transition to nut butter or nut flour) or can stop and wait at least 60 min before sending home	

ONLINE REPOSITORY

Conversion factors for calculating protein content of commercially available food products used in OIT:

- Peanut
 - 1 Bamba = 100 mg peanut protein
 - 1 Mission MightyMe multi-nut puff = 4.5 mg peanut protein
 - 1 Mission MightyMe peanut puff = 43 mg peanut protein
 - 1 tablespoon peanut butter = 3500 mg peanut protein
- Cashew
 - 1 tablespoon cashew butter = 2500 mg cashew protein
- 1 Mission MightyMe multi-nut puff = 4.5 mg cashew protein
- Sesame
 - 1 sesame seed (crushed) = 0.5 mg sesame protein
 - 1 tablespoon tahini = 2500 mg sesame protein
- Pistachio
 - 1 tablespoon pistachio butter = 3500 mg pistachio protein
- Almond
 - 1 tablespoon almond butter = 3500 mg almond protein
 - 1 Mission MightyMe multi-nut puff = 4.5 mg almond protein

How does this study impact current management guidelines? Patients younger than 24 months should be offered oral immunotherapy for food allergy with treatment initiation as soon as possible. Home up dosing can safely be offered to patients, increasing accessibility and feasibility.

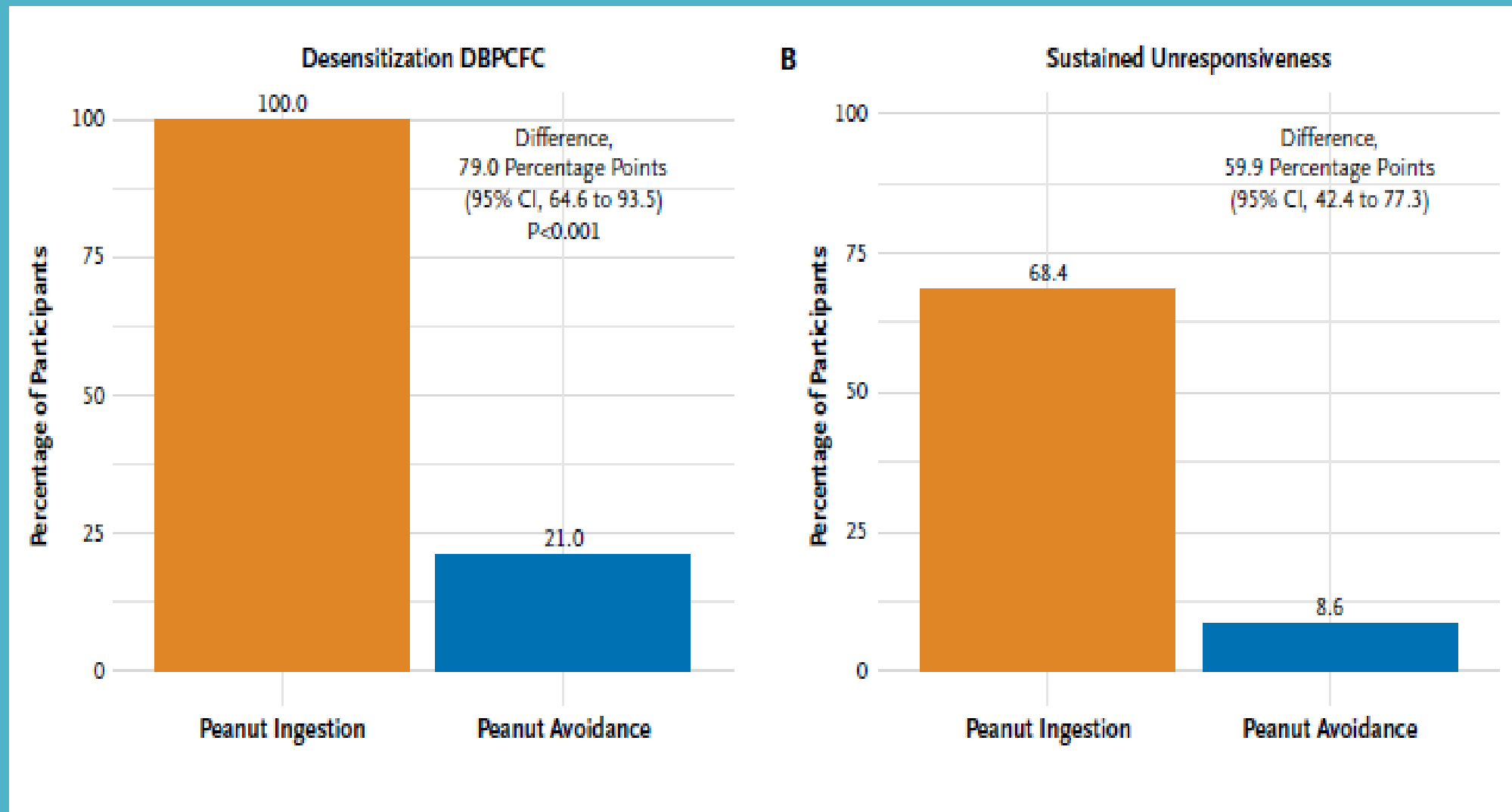
**** Makes sense 😊

ORIGINAL ARTICLE

Peanut Oral Immunotherapy in Children with High-Threshold Peanut Allergy

Scott H. Sicherer, M.D.,¹ Supinda Bunyavanich, M.D., M.P.H., M.Phil.,¹ M. Cecilia Berin, Ph.D.,² Tracy Lo, R.N.,¹ Marion Groetch, M.S., R.D.N.,¹ Allison Schaible, M.S., R.D.N.,¹ Susan A. Perry, R.N.,³ Lisa M. Wheatley, M.D., M.P.H.,³ Patricia C. Fulkerson, M.D., Ph.D.,³ Helena L. Chang, M.S.,⁴ Mayte Suárez-Fariñas, Ph.D.,⁴ Hugh A. Sampson, M.D.,¹ and Julie Wang, M.D.¹

- 4 to 14 yo (average about 6-7 yo)
- Reacted at 443 to 5043 mg peanut protein
- Home dose PB versus avoidance
- Peanut IgE -5.5 Ara H2 – 3.8



Not so much on age, likely IgE .. But study showed can free eat even if starting in elementary age kids

17 yo Indian doctor's kid senior high school going to GA Tech. Known PN allergy as baby. IgE 700. PN IgE – 80 Ara H2 – 45. Parents about accidental exposures before college.

- A. OIT (low dose)
- B. SLIT
- C. Avoidance
- D. Xolair

Peanut Oral Immunotherapy Using 30 and 300 mg Maintenance Doses

JACI in Practice Jan 2026



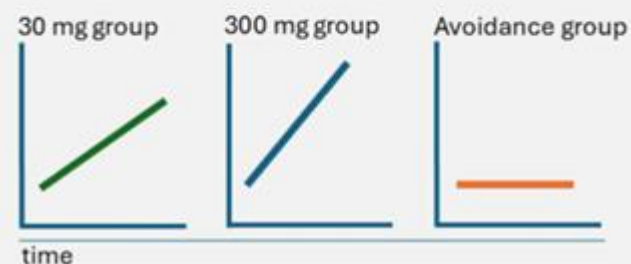
Julia E.M. Upton, MD, MPH^{a,b,c,*}, Diana Toscano-Rivero, MD^{d,*}, Danbing Ke, PhD^e, Alireza Berenji, MD^b,

VISUAL SUMMARY

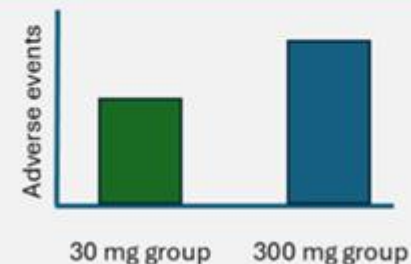
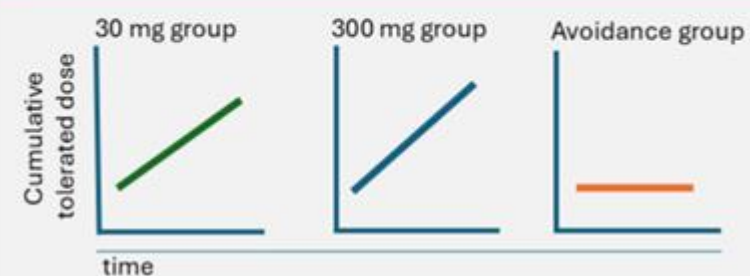
Study Design: Prospective, blinded randomized controlled trial of 30 mg and 300 mg oral immunotherapy (OIT) maintenance doses versus avoidance.



Laboratory Outcomes: peanut IgG4 and BAT threshold significantly increased in both OIT groups versus baseline and versus avoidance. BAT threshold increased more with 300 mg than 30 mg maintenance dose.



Clinical Outcomes: Both OIT groups had significant threshold increases versus baseline and versus avoidance. Adverse events fewer in the 30 mg maintenance group than 300 mg maintenance group.



How low can we go: preliminary efficacy of low dose peanut OIT

Upton et al. Abstract AAAAI 2023

Results

- Median age 10 yo
- PP tolerant 44 mg on entry (older, likely higher IgEs)
- VLOIT- 12/15 completed 1 year,
- 300mg OIT- 9/15 complete 1 year
- VLOIT- 10/12 tolerated 443mg, 5/12 tolerated >1043 mg
- Conclusion- VLOIT increased threshold of reactions and may allow for the simplified OIT regiments
- Waiting further data but clinically makes sense to me

17 yo Indian senior high school. Known PN allergy as baby. IgE 700. PN IgE – 80 Ara H2 – 45. Parents about accidental exposures before college.

A. OIT (low dose)

B. SLIT

C. Avoidance

D. Xolair

- IMO SLIT/ Low dose OIT- same. Likely doing PN OIT to 25 mg PB FIT (12.5 mg protein). Switch to 1 or 2 TN Mighty Me Puffs (5-10mg protein- SLIT doses). Then will stop when first month college 😊

Timing of Cow's Milk OIT and adverse reactions in children: A 15 year experience. Annals of Allergy April 2026

- Retrospective 145 children study out of Turkey
- 3 groups <24 months, 24-48 months, and >48 months
- >48 month- worse (higher IgE, more issue)
- <24 months- fewer severe reactions and no anaphylaxis
- Many allergist (IMO) get this wrong. Don't sleep on these patients. Recheck the IgE sooner (4 month or so) to make sure in the 80% going down versus 20% going up. If up, intervene.
- Case example- 12 mo PN, milk, egg allergic kid. Reacted to all. IgE to PN10, milk 10, egg 10

Top 9 Protein- Drops 4 mg/1 ml

Started in end of Nov 2025

- Not sponsored, Random Discussion
- OIT –finding stable protein source, microdose over time safely

In approximately 6 months ordered (new starts about 150 over 6 months- milk and egg):

- Egg – 130
- Milk - 67
- Peanut – 28
- Some of the other foods, most useful for Milk and Egg when trying to get to accurate 1 mg or even 0.5 mg dosing

Top 9 allow to Microdose to low amounts

We don't use dilutions

Cashew solution is given every 20-30 minutes.

Time	Cashew Drops	Volume (ml)	Protein/dose (mg)*
	1 drop	0.05	0.20
	2 drops	0.10	0,40
	3 drops	0.15	0.60
	5 drops	0.25	1.00
	capsule	5 mg	1.5
	1 hour post dose		

Egg solution is given every 20-30 minutes.

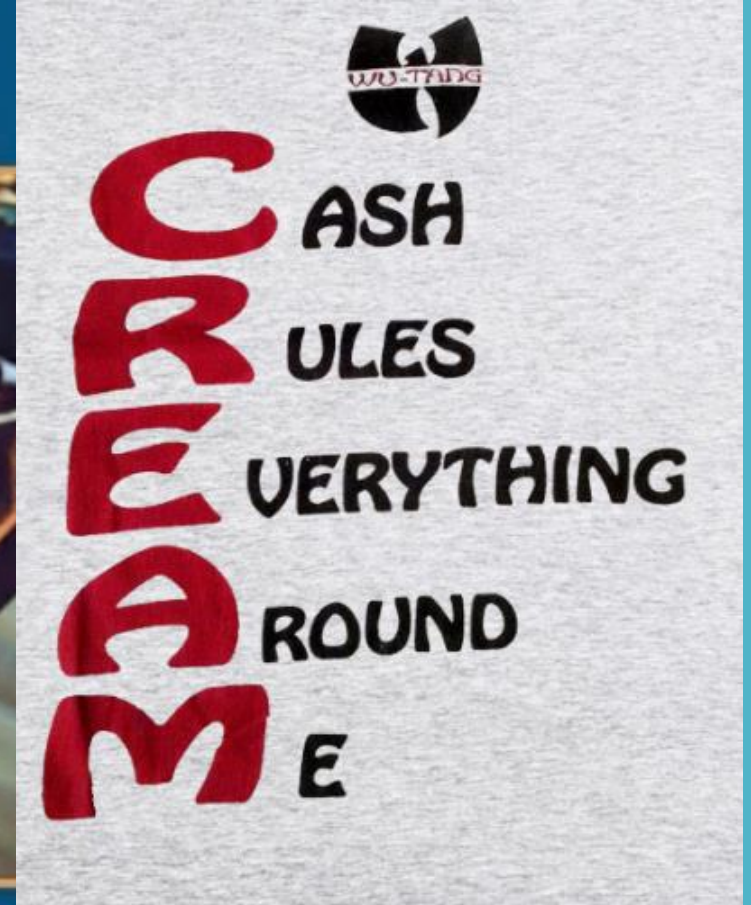
Time	Egg Drops	Volume (ml)	Protein/dose (mg)*
	1 drop	0.05	0.20
	2 drops	0.10	0,40
	3 drops	0.15	0.60
	5 drops	0.25	1.00
	1 hour post dose		

Omalizumab is as Effective as Multi-Food Oral Immunotherapy



American Academy of
Allergy Asthma & Immunology

Natural Food Oral Immunotherapy is as Effective as Omalizumab



DR. CHACKO SPEAKING AT THE FAST MEETING TO HUNDREDS OF ALLERGISTS... THIS WAS JUST PART OF HIS LITERATURE REVIEW AND HE USE THE WISE WORDS OF WU-TANG CLAN SONG "CREAM" ON HOW FINANCIAL INFLUENCES MAY CONTROL THE NARRATIVE WE HEAR.

**PALFORZIA, PEANUT PATCH,
XOLAIR... C.R.E.A.M. ?**



wutangclan was invited to be a collaborator but hasn't accepted yet.

- This meeting not about money but trying to do the right things for our patients
- Very unique to have a meeting where money doesn't control the narrative
- Thank you