



# MULTI-FOOD OIT

Jennifer Fergeson, DO  
Windom Allergy, Asthma & Sinus  
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# Multiple food allergy

- 30% of children with food allergy are multi-food allergic
- Health-related quality of life is lower with multiple vs. single food allergy
- 66% of patients report > 5 reactions to their peanut or tree nut allergens<sup>2</sup>
- Single food OIT in multi-food allergic children is not as helpful



1. Andorf S, Borres M, Block W et al. Association of Clinical Reactivity with Sensitization to Allergen Component sin Multifood-Allergic Children. *J Allergy Clin Immunol Pract.* 2017; 5:5:1325-1333
2. Eapen A, Lavery W, et al. Oral immunotherapy for multiple foods in a pediatric allergy clinic setting. *Ann Allergy Asthma Immunol.* 2019; 123:573-581

# Oral Immunotherapy for multiple foods in a pediatric allergy clinic setting

- 45 patients receiving OIT to various foods, majority being tree nuts and peanuts
- 76% receiving OIT to 4 or fewer foods
- Reactions
  - a) 49% during up-dosing or in 1<sup>st</sup> 3 months of maintenance
  - b) 91% mild (grade 1), 9% moderate (grade 2)
  - c) 64% required NO medication for symptoms
  - d) No reactions after the first 3 months on daily maintenance dosing

# Oral Immunotherapy for multiple foods in a pediatric allergy clinic setting

- 35/45 (78%) patients undergoing daily maintenance successfully
- Multi-food OIT in the clinical setting is feasible and reasonably safe compared with multiple food avoidance



# Food OIT

## Adherence and Efficacy

- Multi-food OIT with the lowest effective dose to each food is preferable
- Peanut OIT at 3 grams versus 1.2 grams of protein<sup>1</sup>
  - a) Adherence significantly better at 1.2 grams
  - b) Efficacy similar
- Lower maintenance dose of 300mg of peanut protein as effective as 3 grams<sup>2</sup>



1. Nachson L et al. A long-term outcome of peanut oral immunotherapy: real life experience. *Pediatr Allergy Immunol.* 2018;29:519-526

2. Vickery BP et al. Early oral immunotherapy in peanut allergic preschool children is safe and highly effective. *J Allergy Clin Immunol.* 2017; 139:173-181

# Multi-food OIT as Safe and Effective as Single Food OIT

- 2014-2018 - 77 multi-food OIT compared to 162 peanut OIT
- Mean of 2.3 foods used (range 2-4 foods)
- 74% of multi-food patients reached maintenance vs. 85% peanut, over median 231 days vs. 248 days

**Table 2.** Foods used in Multi-Food OIT

	Cashew	Walnut	Peanut	Hazelnut	Egg	Milk	Sesame
<b># cases (%)</b>	51 (65%)	41 (53%)	39 (50%)	13 (17%)	13 (17%)	8 (10%)	4 (5%)
<b>Most common combinations:</b>	Cashew/Peanut: 15 (19%)		Cashew/Walnut/Peanut: 10 (13%)				
	Cashew/Walnut: 9 (12%)		Cashew/Walnut/Hazelnut: 9 (12%)				

# Multi-food OIT as Safe and Effective as Single Food OIT

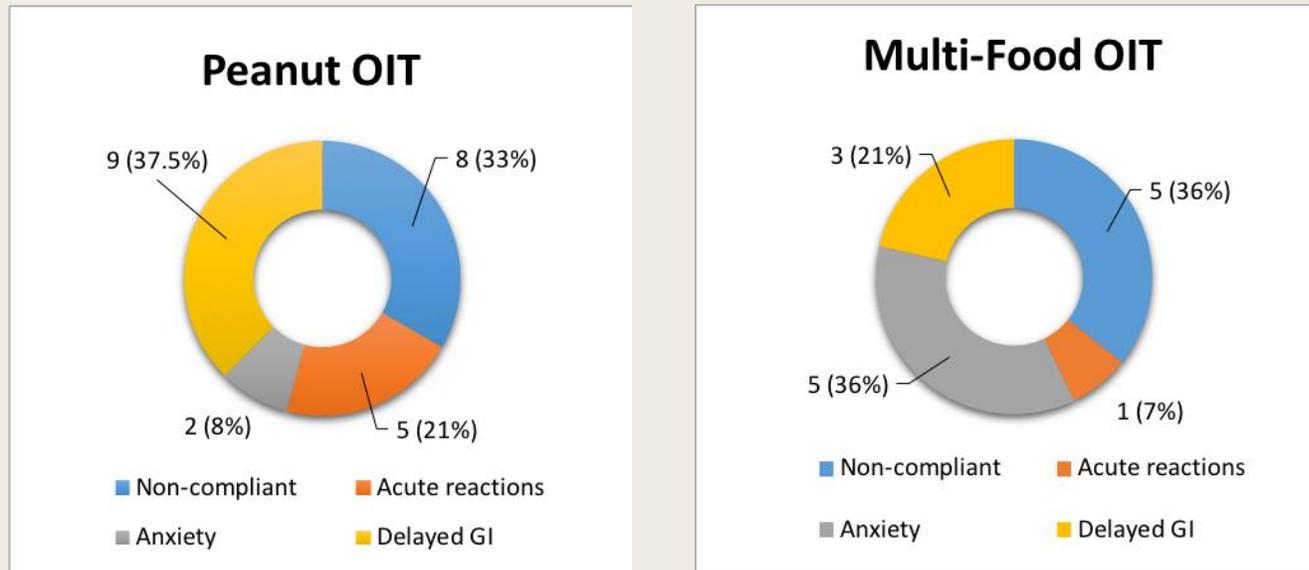


Figure 2. Reasons for discontinuing OIT

	# patients	Age (yrs)	SlgE (median)	Wheal (median)	M (top) dose	% reach M	Post-M OFC cumulative dose	Passed post-M OFC	Patients using Epi in 1 <sup>st</sup> year
Our study peanut:	162	0.6 - 36	53	15 mm	750 - 2000 mg	85%	6000 mg	100% (63/63)	14%
Multi-food:	77	0.9 - 19	32	15 mm	750 - 3000 mg	74%	NA	NA	8%
Palforzia (1):	372	4 - 17	69	11 mm	300 mg	79%	1043 mg	97% (285/294)	14%
Dallas peanut (2):	67	0.75 - 16	19	ND	1500-3000 mg	93%	3000-6000	94% (63/67)	8%
Canada peanut (3):	270	0.75 - 5	5	7 mm	300-320 mg	90%	ND	ND	4%

Table 4: Epi use - comparison to other trials

## References

1. N Engl J Med 2018;379: 1991-2001.
2. J Allergy Clin Immunol 2019;143: AB275, abs 836.
3. J Allergy Clin Immunol Pract 2019;7: 2759-67.

# Walnut and Cashew Are Dominant Nuts

- 60 children with multiple food allergies participated in multi-OFC's at Stanford
- 100% (29) of pecan allergic patients reacted to walnut, whereas 3 of 32 walnut allergic patients tolerated pecan
- 100% (42) of pistachio allergic patients reacted to cashew, whereas 4 of 46 cashew allergic patients tolerated pistachio
- Epi used in 5 of 311 OFC's (1.6%)

# Walnut OIT: Nut Cracker

- Cross reactivity in their prior study: 100% of pecan and 79% hazelnut allergic patients were also allergic to walnut
- 55 patients on walnut OIT to 4 gm protein (~6 nuts)
- 89% reached maintenance, 15% received Epi
- 82% were pecan allergic +OFC, all passed OFC after OIT
- 93% (14/15) were co-allergic to hazelnut either passed hazelnut OFC or tolerated >2 nuts
- 26% of 19 pts. co-allergic to cashew improved

# Cashew and Walnut OIT

- 88 patients completed cashew OIT and 94% passed pistachio challenges
- 31 patients completed walnut OIT and 97% passed pecan challenges
- Those that failed did so with mild symptoms, median eliciting dose was 1000mg of protein

# Other Cross Reactive Foods

Beyond nuts, less is known about cross-protection of one OIT food to others

- Legumes – lentils, beans, chickpeas
- Seeds – sesame, sunflower, mustard, flax seed
- Shellfish
- Grains – wheat, barley, rye



# Multi-Food OIT

## Our experience at Windom Allergy

- ~30% of our 500+ patients have completed multi-food OIT
- Saves time and money to combine foods
- Typically no more than 3 foods, may choose not to combine sIgE >100 foods, especially milk and egg in older patients
- Same protocol, just cut Day 1 doses by 1 per extra food (Dr. Wasserman)
- Can always drop a food(s) if difficulty with dose escalation during OIT build up process

# Post OIT challenge

- **Multi-food OIT high dose challenge** – 4-8 weeks after reaching maintenance dose
  - a) 2 foods - 3 x Maintenance dose
  - b) 3 or more foods - 2 x Maintenance dose
- **Post OIT graded challenge to cross reactive nut** - 4-8 weeks after reaching maintenance dose. For children < 5 y.o. can skip final dose

## Pecan

Dose*	Observe for	Protein/dose
3 gm (1 nut)	30 min.	300 mg
10 gm (~3 nuts)	30 min.	1 gm
25 gm (~8 nuts)	1 hour	2.5 gm

## Pistachio

Dose*	Observe for	Protein/dose
0.58 gm	30 min.	100 mg
5.9 gm (~11 nuts)	30 min	1000 mg
17 gm (~ 26 nuts)	1 hour	3 gm

## Hazelnut

Dose*	Observe for	Protein/dose
2 gm (~2 nuts)	30 min.	300 mg
6.8 gm (~7 nuts)	30 min.	1000 mg
20 gm (20 nuts)	1 hour	3 gm

Thank you!

