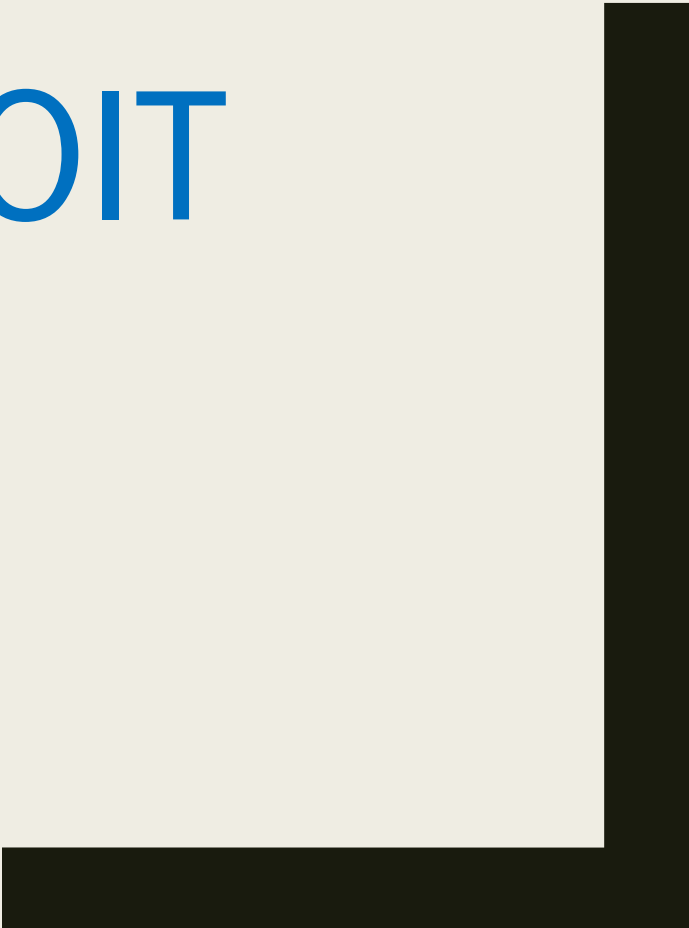




MULTI-FOOD OIT

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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 allergens²
- 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 1st 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 protein¹
 - a) Adherence significantly better at 1.2 grams
 - b) Efficacy similar
- Lower maintenance dose of 300mg of peanut protein as effective as 3 grams²



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
# cases (%)	51 (65%)	41 (53%)	39 (50%)	13 (17%)	13 (17%)	8 (10%)	4 (5%)
Most common combinations:	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

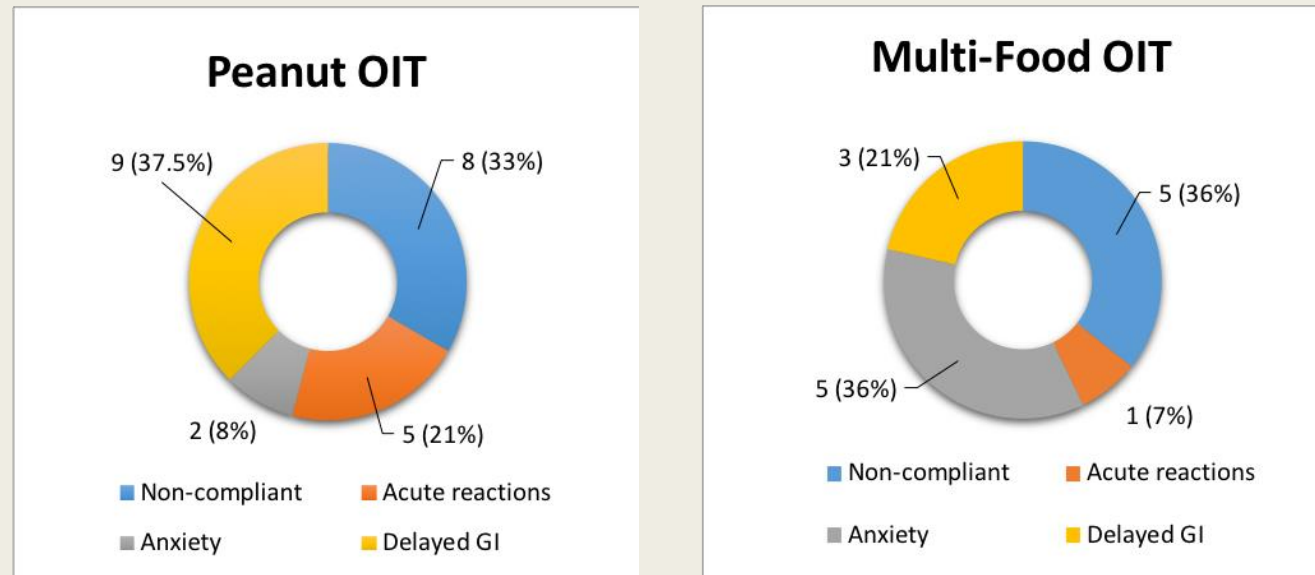


Figure 2. Reasons for discontinuing OIT

	# 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 st 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

Wasserman R, Windom, H. Exploiting Nut Cross Reactivity to Facilitate Real World Treatment of Tree Nut Allergy. *Ann All Asthma Immunol* 2021; In press

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!

