

Disclosures	Children's Robert H. Lurie Children's Hospital of Chicogo
Honorarium provided by Nutricia	
The opinions reflected in this presentation are those of t	he speaker and independent of
Nutricia North America	

Learning objectives	Children's Hospital of Chicago
<ul> <li>Participants in this activity will learn to:         <ul> <li>Identify appropriate formula selection for infants with for related conditions when breast milk is not possible</li> </ul> </li> </ul>	od allergies and
<ul> <li>List appropriate milk substitutes for children one year of older with food allergies and related conditions</li> </ul>	age and
- Demonstrate practical tips for formula adherence	
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There are a wide range of symptoms for IgE and non-IgE- mediated Charles Repetitive CMA making formula selection difficult					
IgE-Mediated <sup>1</sup>	Non-IgE-Mediated <sup>1</sup>				
<ul> <li>Systemic IgE-mediated reactions (anaphylaxis)</li> <li>IgE-mediated gastrointestinal reactions</li> <li>Oral allergy syndrome</li> <li>IgE-mediated respiratory reactions:         <ul> <li>Asthma and rhinitis secondary to ingestion of milk</li> <li>Asthma and rhinitis secondary to inhalation of milk</li> <li>JgE-mediated cutaneous reactions:                 <ul> <li>Acute urticaria or angioedema</li> <li>Contact urticaria</li> <li>Atopic dermatitis</li> </ul> </li> </ul> </li> </ul>	<ul> <li>Atopic dermatitis</li> <li>Gastroesophageal reflux (GER)</li> <li>Eosinophilic esophagitis (EoE)</li> <li>Cow's milk protein-induced enteropathy</li> <li>Constipation</li> <li>Severe irritability (colic)</li> <li>Food protein-induced gastroenteritis</li> <li>Food protein-induced enterocolitis syndrome (FPIES)</li> <li>Food protein-induced proctocolitis</li> <li>Non-IgE-mediated respiratory reactions</li> <li>Heiner's Syndrome</li> </ul>				

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When bre	ast milk is not ava	ailable	Children's Hospital of Chica
<ul> <li>Initiate s</li> <li>– Hypo</li> </ul>	substitute formula: allergenic OR soy (if tolera	nt) > 6 months of age <sup>1,2</sup>	
– No m – No pa	ammalian animal milks artially hydrolyzed formula:	s	
	Recommendations	Partially Hydrolyzed formulas	
	DRACMA <sup>1</sup>	Not recommended	
	NIAID US <sup>3</sup>	Not recommended	
	ESPGHAN <sup>4</sup>	Not recommended	
M Northwestern Medicin Ferters School of Medicin	1. Fiocchi, et al. Pediatr Allergy Immunol. 2010;21 Suppl 2010;126:01 SE 3. Koletrio. et al. J. Rediatr Gastroanter	121:1-125.2. Nowak-Wegtryn, et al. J Allergy Clin Immunol. 2017;139:111 al Nutr. 3012-65-231.0	11-26.e4.3. Boyce, et al. J Allergy Clin Immu







Infant formula act	Children's Robert H. Lurie Children's Hospital of Chicogo
Passed into law in 1980 section 201(z) and in Title 21 section 106 Federal Regulations (CFR)	5.3 of the Code of
Nutrient specifications include minimum amounts for 29 nutrients amounts for 9 of those nutrients	and maximum
Good manufacturing practices	
Recall procedures	
Formulas manufactured in US or abroad must meet standards to	be sold in US
MNorthwestern Medicher Merleng breist im Medicher (* 3331.005. inder Lemmis-Innont and Demetic Intelementation Date: 07707/0331/65.aux)	



Eeny meeny miny moe, which formula should we choose ....

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Symptoms not re	Children's Hospital of Chicogo			
First choices for CM	A and related	conditions when	formula is needed	1
Presentation or condition	NIAID US guidelines <sup>6</sup>	DRACMA international guidelines <sup>2,3</sup>	ESPGHAN European guidelines <sup>4</sup>	BSACI British guideline <sup>5</sup>
Cow milk protein- induced enteropathy	Not specified	eHF or AAF AAF "equally reasonable" when AAF cost is low	eHF or AAF if faltering growth + "severe enteronnthy"	eHF severe: AAF





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Severe GI allergies: Eosinophilic esophagitis <sup>1-6</sup>						
First choices for (	CMA and rela	ated conditio	ns when for	mula is nee	ded1	
NIAID         DRACMA         ESPGHAN         BSACI British         AAAAI           Presentation or condition         US guidelines <sup>2</sup> guidelines <sup>2</sup> guidelines <sup>4</sup> US guidelines <sup>6</sup>						
Eosinophilic Esophagitis (EoE)	Not specified - evidence for AAF reviewed	AAF	AAF	AAF	AAF	
<ul> <li>US &amp; international guidelines recommend AAF first-line<sup>2-6</sup></li> </ul>						
M Northwestern Medicine http://w Ferters Intext of Medicine 2014;51	r, et al. J Allergy Clin Immunol P www.worldallergy.org/profession 1:107-18.5. Luyt, et al. Clin Exp A	<pre>sact. 2018;6:383-99.2.Flocchi, et al. al/allergic_diseases_center/cows_m llergy. 2014;44.6. Groetch, et al. J A</pre>	Pediatr Allergy Immunol. 2010;2 ilk_allergy_in_children/ [June 28 llergy Clin Immunol Pract. 2017;5	15uppl 21:1-125. 3. Motala, et al. (2017]. 4. Papadopoulou, et al. (312-24.x29. 7. Boyce, et al. Nu	al. J Pediatr Gastroenterol Nutr. tr Res. 2011;31:61-75.	

Severe GI Allergies: Food protein-induced enterocolitis syndrome <sup>1.6</sup>							
First choices for CMA and related conditions when formula is needed <sup>1</sup>							
Presentation or condition	US guidelines <sup>2</sup>	FPIES guidelines <sup>3</sup>	ESPGHAN European guidelines <sup>4</sup>	BSACI British guideline <sup>5</sup>	international guidelines <sup>6</sup>		
Food protein- induced enterocolitis syndrome (FPIES)	eHF or AAF	eHF or AAF	eHF or AAF if "severe enteropathy" + faltering growth	AAF	AAF		
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DRACMA: CMP > 2 years old	Children's Hospital of Chicogo
Nutritionally adequate elimination diet can be provided by solid foods and liquids free of CMP unless the child has multiple food allergies (MFA).	
Avoid mammalian milks	
MFA or eosinophilic disorders: AAF may be considered to allow symptom improvement before an oral challenge with CMP is performed.	
Counseling by an RD experienced in pediatric nutrition is highly recommended to avoid hidden allergens.	
NN Northwestern Medicine' ferrary (and et Medicine)	Flocchi, et al. Pediatr Allergy Immunol. 2010;21 Suppl 21:1-125.
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# Living the milk free life...

- Extremely popular:

   Increased awareness of CMP intolerance
   Desire for vegan/plant-based dietary habits
- Vary widely in composition macronutrients & micronutrients
- Almost half (48%) of Americans have purchased both dairy- and plant-based milks over the past six months, according to an IPSOS survey of 2,006 adults commissioned by Dairy Management Inc.

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						Ann & Robe	ert H. Lurie
Plant-base	ed beverag	ges carry	risks		<u>/!</u>	Children's Hospi	tal of Chi
Per 1 cup <sup>1</sup>	Whole milk	Almond	Coconut	Oat	Pea	Soy	AA
Calories	150	<b>30-</b> 100	45-90	130	115	90	24
Protein (g)	8	1	0-1	4	8	6	7-
Adjusted protein <sup>2</sup> (g)	8	0.16		2.9	4.8	4.8	7-
Fat (g)	8	3	5	2.5	5	3.5	~:
CHO (g)	13	9-22	8-13	24	11	15	~.
Sugar (g)	12	7-20	0-9	19	10	9	2-
Calcium (mg)	300	300-450	<b>100</b> -450	450	450	400	~2
Vitamin D (IU)	120	110	125	120	150	120	>1
Other risks		Common allergen			Soy content	Common allergen	



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Protein contentquality or qua	Children's Hospital of Chicogo					
Amino acid composition: adequate	DIAAS scores & PD	AAS scores & PDCAA Scores for Foods				
<ul> <li>Indispensable, dispensable and conditionally indispensable amino acids</li> </ul>	Food	DIAAS	PDCAAS			
	Milk protein concentrate	1.18	1.0			
Protein digestibility:     Protein Directibility:	Soy protein isolate	0.94	1.0			
Acid Score (PDCAAS) - USDA     Digestible Indispensable Amino Acid	Pea protein concentrate	0.822	0.979			
Score (DIAAS) - FAO: based on ileal amino acid digestibility	Rice protein concentrate	0.371	0.419			
<ul> <li>Amino acid bioavailability varies and is often not known.</li> </ul>	Cooked rolled oats	0.542	0.670			
Mi Northwestern Mediciner Renters School of Medice Hertaler S. Nutrients 2020, 12, 3704; doi:10.3390/nu121223704. Ruther	urd SM, et al. J Nutr. 2015 Feb;145)	2):372-9. doi: 10.3945/(n.114.1	195438. Epub 2014 Nov 26. PMID: 2564436			



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Practical Management of Infants with Cow Milk Allergy and the Role of the Intestinal Microbiota. Are We Doing Enough?
Kelly Tappenden, PhD, RD, FASPEN Professor and Head, Dept of Kinesiology and Nutrition University of Illinois at Chicago Editor-in-Chief, Journal of Parenteral and Enteral Nutrition
Food Allergy University December 10, 2021



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1 month	Eczema	2 years	Abrahamsson et al., JACI 2012;129:434-440.
Day 7	Eczema	12 months	Ismail et al., PAI 2012:23:674-681.
1 week	Eczema	18 months	Wang et al., JACI 2008;121:129-134.
1 week/ 12 months	lgE, eos, rhinitis; NOT asthma, eczema	up to 6 years	Bisgaard et al., JACI 2011; 129:646- 652.
3 weeks	Asthma		Vael et al., BMC Microbiol 2011;11:68

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fe and development or protection against diseases								
Disruptive factor	Study	Cohort characteristics	Outcomes					
C-section	Sevelsted et al., 2015	1.9 million Danish term children, ages 0-15 years	Asthma, systemic connective tissues disorders, juvenile arthritis, IBDs, immune deficiencies and leukemia					
	Huh et al., 2012	1,255 US children, age 3 years	Obesity, higher body-mass index and sum of skinfolds					
	Eggesbø et al., 2003	2,803 Norwegian children, 0-2 years	Reactions to egg, fish or nuts, and a fourfold increase in egg allergy					
	Risnes et al., 2011 Hoskin-Parr et al., 2013	1,401 US children, ages 0-6 months 5,780 UK children, ages 0-2 years	Asthma and allergy Asthma and eczema					
Antibiotic	Saari et al., 2015	12,062 Finnish children, ages 0-2 years	Overweight and obesity					
treatment	Schwartz et al. 2016	163,820 US children ages 2-18 years	Weight gain					
	Kronman et al., 2012	9 million UK children	IBD development					
Probiotics	Maldonado et al., 2012	215 Spanish children, ages 0-6 months	Reduction in gastrointestinal and upper respiratory tract infections					
	Braegger et al., 2011	ESPGHAN Committee on Nutrition	Reduction in nonspecific gastrointestinal infections					
Diet supplements	Zimmerman et al., 2010	Iron, 139 African children, ages 6-14 years	Intestinal inflammation, lower frequency of colic or irritability					
Hygiene	Hesselmar et al., 2013	184 children, pacifier cleaning, ages 0-3 years	Lower risk of developing asthma, allergy and sensitization					
Pets	Virtanen et al., 2014	3.143 Finnish children, ages 0-1 year	Reduction in risk of preclinical type I diabetes					



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Breastfeeding	Formula Feeding
Additional production of the second s	and the second s



























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Load Author (Date)	Pepulation and Type of Study	Male	Mean Age (Monthui	Amount of Formula Consumed/Day (mL) Mean ± 5D	AAF-5yn	ÅAF	Intervention Duration	Timepoint Oulcomes Measured
Harvey (2010 [29] Full paper	Infants with IgE mediated CMPA aged 0-36 months One arm 2007CTC and 7 day leading period	615	17.5, vonge 3.3-46.9	Noteported	30	- 34	7.849	7 days
	Full-term healthy infants aged 3-16 menths, RCT \$	67%	30-6, nargy 3-34	AAJ-Spx: 349 ± 122 % AAU-331 ± 124 %	39	54	li unto	2.4.8.32 & 16 maks
Burks (2015) [34] Full paper	Infants with IgE or non-IgE mudiahed CMPA aged 0-6 months, IKT	.65	45, ringe 0.6-59	Not reported, lotalar man reported as comparable in both groups	.90	19	16 works	4.6.10 sector
Candy (2010) [32] ANNEON study, full paper	Infants with non-lgE modiated CMPA aged 0-13 months, RCT Included Insaid feel buildby reference group (not sanXimised)	73%	8, nange 1.2-12.8	Week.9 AAP-5(10.652 ± 176) AAP-639 ± 212	35	56	9 seeks	4.6 Frenks
Fox (2019) [10] <sup>1</sup> ASSESN study, full piper	Infants with non-light modiated CMPA aged 0-13 months 26 work follow-up of Candy (2018)	73%	6, ninge 1.2-12.6	Week 9 AAF-Squid-32 ± 176 AAF-63# ± 112	38	-36	9 seeks	5, 12 A 26 oyeka
Nopesets (2019) [40] <sup>5</sup> ASSIGN study, bull paper	Infante with new SgE modiated CMEA agod II-D menths Gene-sequencing analysis from Candy (2018) and Fox (2019)	735	6, compr 3.2-12.0	Work 6 AAF-5416-512 ± 1781 AAF-639r ± 212	38	36	t weeks	6,12.6 26 works
Chatchates (2019) [71] PRESTO-study 1, conference abstract	Infants with confirmed IgE mediated CMPA aged 0-12 separates, ICT	72%	9.36, 947 2.53	Al 12 months AAF-byn: 347 is 302			12 meetle	12 months
Wapewis (2020) [10] PRESTO atsaly L confirmence abstract	Infants with confirmed IgE mediated CMPA aged 0-13 menths, RCT			AAF 530 ± 508				





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Essential Fatty Acid (EFA) - Follow up	
<ul> <li>Follow up</li> <li>If findings make sense <ul> <li>Increase EFA intake</li> <li>Consider obtaining a serum essential fatty acid profile</li> </ul> </li> <li>If findings don't make sense <ul> <li>Ask more questions</li> <li>Consider alternate causes of concerning exam findings</li> </ul> </li> </ul>	erver tate tate

	Protein
Protein Deficiency Sign	Exam
Hair: severe loss, color change (overall or at a certain hair length), easily plucked	Look at scalp and hair, gently tug hair at roots, ask questions
Skin: color loss, dark cheeks, lack of fat underneath, slow wound healing	Look at face, gently pinch skin on any area except hands and elbows; similar to feeling for triceps skinfold; look at all exposed/exposable skin; ask questions
Parotid gland: enlarged	Palpate jaw line below ears
Nails: vertical or horizontal indentation running across all fingernails, soft scooped appearance	Look at and palpate fingemails
Edema: bilateral, 'moon' face	Gently press on lowest section of body, whether legs if sitting or standing, feet or lower back if laying down for long time period look at face and palpate for fat stores/muscle mass/fluid
Muscles: decreased mass and density	Palpate muscles* and compare to past assessments *temple, clavicle, deltoid, scapular area, quads, knees, calves
Demeanor: listlessness	Observe demeanor; Ask questions
Signs can also be caused by: deficiencies of iron, zinc, biofin, mangane chemotherapy; radiation to head; stress; endocrine disorders; medicatii syndrome; severe litness; immunosuppressive therapy; diabetes; lupus; R	Les selenium copper, calcium, calories, EFA, B vitamins, vitamin C, hydration; aging; one; overprocessing of hoir; builmic; mumps; salivary duc! stones; portal cirhasis; Sjogren's aynoud's disease; hypothyroidim; severe arterial disease; poor skin care; steroids

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Calcium (deficiency)		
Calcium Deficiency Sign	Exam	
Muscles: twitches or cramps	Look at muscles; Ask questions	
Bone: demineralization	Read x ray and DXA imaging results	
Signs can also be caused by: altered levels of hydration, magnesium, zinc, phosphorus; vitamins B6, D, and A		
>		

Calcium (toxicity)		
Calcium TOXICITY Sign	Exam	
Bone: pain	Ask questions	
<b>Neuro:</b> headaches, fatigue, lethargy, memory problems, irritability, depression	Observe demeanor; Ask questions	
GI: nausea, constipation, anorexia	Ask questions	
Muscles: pain, weakness, cramps	Look at muscles; Ask questions	
Signs can also be caused by: altered intake of vitamin D, phosphorus, potassium, vitamin C, iron, chloride, sodium, magnesium, B vitamins; fractures; arthritis; cancer; diabetes		





Vitamin D			
Vitamin D Deficiency Sign	Exam		
Gums: red, puffy	Look at gums		
Teeth: holes, chips, dark spots	Look at teeth		
<b>Bone:</b> demineralization, tenderness, pain, epiphyseal enlargement	Read x-ray and DXA imaging results, ask questions; look at and touch wrists, knees, legs, forehead		
Muscles: weakness, twitches, cramps, pain Have patient push against your hand; Look at and palpate muscles; Ask questions			
Signs can also be caused by: deficiencies of vitamin C, niacin, folate, zinc, vitamin D, vitamin Bô, fluoride, calcium, phosphorus, potassium, iron, magnesium, chloride, sodium, biotin, zinc; dehydration; genetics; smoking; pregnancy; diabetes: medications; poor oral hygiene; fibromyalgia; fractures; arthrifis; cancer; toxicity: vitamin A			





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	Zinc	
Zinc Deficiency Sign	Exam	
Hair: severe loss	Look at scalp; Ask questions	
Gums: red, puffy	Look at gums	
Taste: loss or change	Look at tongue; Ask questions	
Nails: indentation running horizontally across all nails	Look at fingernails	
Skin: slow wound healing; red and itchy; waxy, oily, crusty especially scalp/lips/nose; severe diaper rash	Look at all exposed/exposable skin; Ask questions	
Neuromuscular: seizures, memory impairment, behavioral disturbances	Observe demeanor; Ask questions of patient and caregivers	
Signs can also be caused by: aging: stress: endocrine disorders; medications; poor and hygiene; pregnancy: diabete, higg genetics: excessive vitamin k intake; deficiencies of vitamis, D, C, A niacin, falate, A, hobilavin, BS, biotin (FA; SARS-C). The mean stress chemotherapy: immunouppressive therapy; por skin ace; stread; dematifit; navad dainage		











B vitamins		
B Vitamin Deficiency Signs	Exam	
Hair: severe loss	Look at scalp; Ask questions	
Skin: waxy, oily, crusty; red and itchy; scaly patches; color loss; hyper- or yellow pigmentation; flushing	Look at skin on all exposed/exposable skin	
Muscles: twitches or cramps; weakness; tenderness; pain	Look at muscles; Ask questions	
Teeth: holes, chips, dark spots	Look at teeth	
Nails: vertical nail ridges	Look at fingernalls	
Eyes: pale conjunctiva, skin redness/fissures, eye weakness	Look at comers of eyes, gently pull down lower eyelid to see the lining of the lower eyelid, watch eyes move (looking for weakness or shaking)	
Mouth: soreness/burning; red swollen skin Tongue: sore/swollen/magenta/smooth/beefy/pale	Look at corners of mouth, lips, tongue	
Body: edema/moon face	Gently press on lowest section of body; look at face and palpate for fat stores/muscle mass/fluid	
GI: anorexia, flatulence, diarrhea	Ask questions	
Neuro: Inability to concentrate, fatigue, depression, peripheral neuropathy, irritability	Observe demeanor; Ask questions	

#### B vitamins - Follow up

- Follow up

   If findings make sense

   Increase intake

   Specific B vitamin testing available

   If findings don't make sense

   Ask more questions

   Consider alternate causes of concerning exam findings



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Vitamin A (toxicity)		
Vitamin A TOXICITY Sign:	Exam:	
Hair: loss	Look at scalp; ask questions	
Neuro: headache	Ask questions	
Mouth: redness, scars, swelling or fissures	Look at corners of mouth	
Gums: swollen, spongy, bleeds easily, redness, retracted	Look at gums	
Nails: brittle, soft, dry, weak or thin, split easily	Look at fingernails	
$\ensuremath{Skin:}\xspace$ waxy, oily, crusty especially scalp/lips/nose; extremely dry	Look at skin on face; look at and feel skin on arms or legs	
Bone: demineralization	Read x ray and DXA imaging results	
Signs can also caused by: deficiency of vitamins A, B, C, D, and B, calcium, phosphorus, iron, xinc, magnesium, essential tatty acids: mainutritian; poor oral hygiene; genetics: smoking: pregnancy; diabetes: medications: dry skin; dehydration; herpes; selenium toxicity; metabolic bone disorder; thyroid disorder; systemic amyloidosis: oging: nasid drainage		







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ocused exam	Areas of concern
Head	hair, skin, eyes, tongue, gums, teeth, taste, thyroid gland, parotid gland, neuro
Arms/Torso	Skin, muscles, fingernails, GI symptoms, bones
Legs	Skin, muscles, bone

NFPE Findings		
NFPE findings	Likely nutrients of concern	Follow up plan
Bone: pain		
Skin: waxy/crusty around nose and forehead		
Skin: extremely dry		
Muscles: decreased mass and density		
No concerns noted accumulation	, d regarding thyroid, hair, taste, gun	, ns, mouth, teeth, nails, neuro, GI, parotid gland, fluid

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Nutrients of Concern		
NFPE findings	Likely nutrients of concern	Follow up plan
Bone: pain	Deficiency: vitamin D Toxicity: calcium	
Skin: waxy/crusty around nose and forehead	Deficiency: zinc, essential fatty acids (EFA), or B vitamins Toxicity: vitamin A	
Skin: extremely dry	Deficiency: EFA	
Muscles: decreased mass and density	Deficiency: protein	
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Nutrients of Concern		
NFPE findings	Likely nutrients of concern	Follow up plan
Bone: pain	Deficiency: vitamin D Toxicity: calcium	Linker
Skin: waxy/crusty around nose and forehead	Deficiency: zinc, essential fatty acids (EFA), or B vitamins Toxicity: vitamin A	() NOUR
Skin: extremely dry	Deficiency: EFA	(-), NOV
Muscles: decreased mass and density	Deficiency: protein	E Bernie and
No concerns noted accumulation	d regarding thyroid, hair, taste, gun	s, mouth, teeth, nails, neuro, GI, parotid gland, fluid
		Prois by Tim Montholder on Unglash

Follow up Plan				
NFPE findings	Likely nutrients of concern	Follow up plan		
Bone: pain	Deficiency: vitamin D Toxicity: calcium	25 hydroxyvitamin D level     Serum calcium level     Discontinue calcium supplement     Depending on lab value; supplement vitamin D		
Skin: waxy/crusty around nose and forehead	Deficiency: zinc, essential fatty acids (EFA), or B vitamins Toxicity: vitamin A	Increase EFA intake     Consider increase of zinc, B vitamin food sources     Readdress if child is taking ANY supplement     containing vitamin A		
Skin: extremely dry	Deficiency: EFA	Increase EFA intake     Consider serum EFA profile		
Muscles: decreased mass and density	Deficiency: protein	Increase protein intake     Reassess for adequate fat stores and growth		
No concerns noted reg accumulation	garding thyroid, hair, taste, gums,	mouth, teeth, nails, neuro, GI, parotid gland, fluid		

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Additional Resource
DeTall C, ed. The Practitioner's Guide to Nutrition-Focused Physical Exam of Infants, Children, and Adolescents. ASPEN; 2019.

## **Food Oral Immunotherapy (OIT):** An Approach to Managing IgE-mediated Food Allergies

Sandy Durrani, MD Associate Professor of Pediatrics Division of Allergy and Immunology Cincinnat Children's Hospital Medical Center University of Cincinnati College of Medicine



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Peanut avoidance is difficult

- Peanut is ubiquitous in the US food industry.
- Food sharing between children in daycare and school settings.
- Cross-contamination of foods and utensils.
- Incorrect ingredient information in restaurants and on product labels.
- Mistakes in label reading.

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Annual incidence of fatal food anaphylaxis is on				
par with death by lightning				
1 70 0				
Annual Incidence	Cause			
~1 in 10	Emergency room attendance due to injury			
1 11 10	Energency room allendance due to injury			

~1 in 100	Death from any cause (Europe or US)			
~1 in 1,500	Death due to an accident (Europe or US)			
~1 in 10,000	Death due to murder (US)			
~1 in 100,000	Death due to fire Death due to murder (Europe)			
~1 in 1 to 8 million	Death due to lightning Death due to food anaphylaxis			
Turner et al. J Allergy Clin Immunol Pract. 2017.				

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## Perception versus reality

# Perception of fatality risk for guardian/person with food allergies

• High





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A 6 y.o. boy, Martin, presents to Allergy Clinic at Cincinnati Children's with a history of peanut allergy.

The family asks whether OIT is a possibility for Martin.

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## Patient: Martin

#### Why family is asking:

- Anxiety is disabling. Martin is fearful of eating at school and restaurants.
- Mom and dad are both fearful of accidents and have limited activities as a result.
- Parents surf the internet researching peanut allergy deaths.
- The smell of peanut butter causes Martin anxiety-induced reactions.

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# Patient: Martin Martin's Medical History

- Hives as a baby with first exposure. No reactions since.
- Peanut IgE >100
- · No asthma
- Infant eczema. Now resolved.

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OIT is a treatment approach in which a patient with food allergies consumes gradually increasing quantities of specific food allergens with the goal of inducing desensitization (i.e., temporary hypo-responsiveness).<sup>1,2</sup> <sup>1</sup>Yood RA. J Investig Allergol Clin Immunol (2017) <sup>2</sup>Gernez, Y and A Nowak-Wegrzyn. JACI Pract (2017)



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## **Clinical allergy**

 Presence of a clinical reaction history consistent with an IgE-mediated reaction (e.g. hives) and IgE

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#### Desensitization

•A **temporary** state of antigen hyporesponsiveness

•Depends on regular antigen exposure

•When dosing is interrupted, the protective effect of desensitization is lost

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## Sustained Unresponsiveness (SU)

- •A state of unresponsiveness despite food avoidance in an individual who has food allergies and has been desensitized
- •SU may represent a state of potential oral tolerance, but there is no agreement on the exact period of food avoidance to indicate a state of permanent oral tolerance.

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## OIT is a way of life

#### Home Dosing Do's

- Give dose every day
- ✓ Give dose at the same time every day with a meal
- ✓Carry epinephrine (adrenaline) autoinjector at all times

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### OIT is a way of life

- Home Dosing Do NOTs
- > Do not feed your child any of the allergy food in their diet
   > Do not take dose on the day of your child's visit
- Do not give the dose 2 hours before or 2 hours after taking other medications
- × Do not give the dose if you think your child is sick
- Do not give the dose 1 hour before your child goes to sleep
- × Do not allow your child to have vigorous activity that would cause sweating or increase in heartbeat, exercise, or take a hot bath for 30 minutes before and 2 hours after the daily dose.

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# Questions about peanut OIT

• What is OIT?

- · What are the benefits and risks of OIT?
- Will OIT cure his allergy?
- · Is Martin a candidate for OIT?

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Adverse reactions are very common during OIT (45-100% of patients) and range from mild to severe (anaphylaxis). Reactions are generally mild. Adverse reactions requiring epinephrine can occur over the course of OIT (0-36% of patients treated with epinephrine). Most reactions are during the build up phase and are mild.



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Eosinophilic esophagitis (EoE) has been reported (2-3%) as an adverse event of OIT.





### What is the risk of an adverse event (AE) during OIT?

A percentage of patients are unable to tolerate therapy due to AEs

- Chronic abdominal pain is the most common symptom leading to discontinuation.
- Eosinophilic esophagitis (EoE) has been reported in several studies (true incidence of EoE in peanut OIT is currently unclear). Cincinnati Children's

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## Will OIT Cure his Allergy?

• OIT is a new therapy whose long-term outcomes are still being investigated. It is too early to know whether peanut OIT can induce long-term tolerance.



 Several studies have used sustained unresponsiveness as a surrogate for permanent tolerance. From these studies, permanent tolerance is unlikely for most people who undergo OIT.



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## Will OIT Cure his Allergy?

Expect Martin to be on lifelong therapy to maintain desensitization and protection



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#### **OIT Candidates**

At Cincinnati Children's:

- ✓9 months to 18 years with confirmed peanut allergy
- Convincing history of an IgE-mediated reaction with levels of sensitization consistent with high probability of reaction OR
- ✓Allergy clinic in-office allergic food challenge to the food

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#### **Exclusions**

- · This is an elective procedure
  - × Poor adherence or healthcare literacy
  - × Unstable asthma or other comorbid condition that is considered by the treating allergists to be contraindicated
- High specific IgE is not exclusionary

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Therapy	Relative Benefit	Relative Risk	
Avoidance	Fewer reactions	Unexpected and can be severe reactions	
	Less daily		
	commitment	Fear of death	
OIT • Not a cure	Risk mitigation	More frequent reactions	
<ul> <li>Elective</li> </ul>	Less anxiety,		
Lifetime commitment	improved social restrictions	Daily and lifetime commitment	
with significant impact on the patient family	Improved QoL	Rare EoE	



For more information or to refer a patient, contact Christa Mills (513) 636-9227 christa.mills@cchmc.org

Cincinnati Children's Food Allergy Program website <u>https://www.cincinnatichildrens.org/service/a/allergy-</u> <u>immunology/programs/food-allergy</u>









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~2 g peanut protein	Bamba (17 g)	Peanut butter (10 g)	Peanuts (8 g)	Peanut-flavore Cereal
Kcal	93	59	45	550
Sugar, g	0.4	0.65	0.38	45
Salt, mg	68	48	1	649
Fat, g	6.1	4.95	3.94	7.5

## Nutritional Outcomes of OIT

Unintended weight gain?

-Frequent consumption of a high calorie food (nuts) Versus

-Changes in dietary patterns, allowing higher intake of packaged snack foods

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