



Dietary Management of the Allergic Infant & Toddler in the Community Setting

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Disclosure

- This presentation is sponsored by Nutricia.
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Topics

- Defining Food Allergy
- Risk of food allergy
- Dietitian's role
- Allergy tests
- Symptoms
- Cow's milk protein allergy and managing the BF & FF infant
- Useful tools
- EoE
- FPIES
- Guidelines
- Timing of first foods

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Definition

Food allergy is “*an adverse health effect arising from a specific immune response that occurs reproducibly on exposure to a given food*” (Boyce et al 2010 NIAID guidelines)

This definition encompasses IgE, Non-IgE, and mixed allergic reactions to foods.

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Who is at risk & risk factors

- Genes? Family Hx of atopy and atopic dermatitis
- Gender? Asthma is common in young males
- Vitamin D deficiency?
- Sensitisation in utero from maternal diet?
- Mode of delivery? C-Section vs NVD
- Epigenetic effects of environment?
 - Hygiene hypothesis: Microbial diversity
 - Vitamin D
 - Infant feeding practices

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Dietitian's Role

- Recognising who is at risk
- Allergy tests, sIgE, SPT
- Growth assessment
- Dietary & food behavioural assessment
- Allergen avoidance
- Advice on appropriate substitutes & recipe modification
- Encouraging 'normal' eating behaviours
- Monitor and support growth at follow up
- Liberalise diet at follow-up if appropriate

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Dietitian's Role

Clinical history assessment

- Skin: eczema, hives etc
- Gut: vomiting, diarrhoea
- Respiratory, asthma
- Test results
- Other clinicians/specialists involved in child's care

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Dietitian's Role

- Nutrition Assessment of infant <4-5 months:
 - Anthropometry
 - Feeding mode (breast or formula or mixed fed)
- For fully breastfed infants
 - Maternal dietary assessment to determine level of potential dietary allergens AND adequacy of diet for optimum nutrition while breastfeeding
- For formula or mixed fed infants
 - Which formula and how many feeds per day

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Dietitian's Role

- Nutrition Assessment of older infant:
 - Anthropometry
 - Early infant feeding (breast or formula)
 - Timing of solid food introduction
 - Texture progression/feeding milestones
 - Fussy feeder, food refusal
 - Appetite
 - Feeding skills
- Food diaries are useful provide information about foods offered and foods consumed

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Dietitian's Role

- Dietary and food allergen knowledge assessment:
 - Unnecessary food restrictions
 - Food label reading skills of parents
 - Hidden sources of allergens
 - Eating out
 - Strategies at daycare and private homes of family & friends
- Educate and counsel the family to:
 - minimise inadvertent exposures
 - Ensure nutritional adequacy

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Tests for allergy - IgE Mediated

- Serum Specific IgE; and/or
- Skin Prick Testing; **PLUS**
- Clinical symptoms
- Elimination of offending food and oral food challenge (medically supervised if high risk of anaphylaxis)
- For positive sIgE or SPT results in the absence of clinical symptoms we have sensitisation **ONLY**. Sensitisation is **NOT** allergy, it indicates high risk for allergy

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Symptoms of Allergy

SKIN	GASTROINTESTINAL TRACT	RESPIRATORY TRACT
Pruritis (itchiness)	Nausea/ vomiting/ reflux	Rhinitis/ Runny nose
Erythema (redness)	Loose & frequent stools	Wheezing/ asthma
Urticaria (hives)	Constipation	Chronic cough
Angioedema (swelling)	Blood or mucus in stool	
Eczema	Abdo pain/ colic	SYSTEMIC
	Perianal redness	Anaphylaxis
	Faltering growth	Shock like symptoms
	Anaemia	
	Dysphagia	

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Cow's Milk Protein Allergy (CMPA)

- Can be IgE or Non-IgE mediated
- Colic & GORD is associated with CMPA, approximately 40% of infants with GORD are CMPA
- Worldwide prevalence of Colic is ~ 20%

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Case study – Baby Alice

- 6 weeks of age, global eczema, highly irritable, blood streaked stools, vomiting +++ after feeds, slow weight gain
- Eczema managed by GP with topical cortisone cream, mo advised to use cream for 3 days only, eczema flares up again on 4th day, this cycle continues, baby is very unhappy
- Fully breastfed on demand
- Mother's diet features 3-4 serves dairy foods daily, both cow's milk products & goats milk cheeses
- Has appointment to see paediatrician in 1 month

CROSS - REACTIVITY

- Cow's milk & goats milk cross reactivity: 92%
- Cow's milk & Soy Cross-reactivity: Ig E: 10 – 14%
Non-IgE: 25 – 60%
- Hen's egg cross reacts with turkey, duck & goose eggs



Sicherer 2001



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Vandenplas et al 2015 Algorithm for managing CMPA in Breastfed & Formula fed infants:

- Breastfed – maternal CMP free diet for 2-4 weeks, if symptoms do not improve, consider compliance, refer to dietitian and medical specialist. If symptoms improve, consider CMP challenge through maternal diet
- Formula fed infant at high risk of anaphylaxis: 2-4 weeks of elemental formula, if symptoms improve continue, if symptoms do not improve then not CMPA

Algorithm for managing CMPA in Breastfed & Formula fed infants:

- Formula fed infant low/no risk of anaphylaxis, 2-4 weeks eHF, with soy if eHF not accepted by infant. If symptoms improve consider challenge with standard CMP formula, if no improvement then elemental formula; and if this doesn't resolve the symptoms, then not CMPA
- Challenges should not be undertaken if clinical allergy is obvious and/or if risk of anaphylaxis is present.

Vandenplas et al 2015. Algorithms for managing infant constipation, colic, regurgitation and cow's milk allergy in formula-fed infants. Acta Paediatrica 104: 449-457

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Dietary management of CMPA in the fully breastfed infant – Baby Alice



- 2 week trial of cow's milk protein (plus other mammalian milk) elimination
- Ensure mother counselled appropriately on alternative sources of calcium
- Some soy products may contain cow's milk protein

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Baby Alice - Limited symptom resolution

- Compliance?
- Further assessment by Medical specialist, in the interim could consider:
- Milk and soy free diet for 2 weeks
- Ensure calcium and vitamin D intake
 - Lactation RDI – 1000 mg calcium;
 - RDI vit D – 5 μg
 - \approx 1 L rice/ oat milk or 2 caltrate + vit D

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Baby Alice - Symptom resolution

- Eczema settling, no new flare ups
- No more bloody stools
- Sleeping better
- Happier baby – happier mum!!
- Recommendation for mum to remain CMP & Soy free until Alice is 6 months of age, then challenge through breast milk
- Alice tolerated CMP & Soy through breast milk, liberalise mother's diet and introduce cheese & yoghurt to Alice

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Milk and Soy Free Information

RPAH Allergy shopping list:

- <http://www.slhd.nsw.gov.au/rpa/allergy/resources/allergy/allergenfreeshoppinglist.pdf>
- Allergy booklets from RPAH:
<http://www.slhd.nsw.gov.au/rpa/allergy/resources/allergy/infosheets.html>
- Other fact sheets available at Sydney Children's Hospital:
<http://www.schn.health.nsw.gov.au/parents-and-carers/fact-sheets>

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CMPA in the older mixed fed infant

- Continue with breastfeeding while introducing other foods
- Challenge through breastmilk, ie maternal ingestion of dairy, if tolerated then consider
- Challenge with baked milk products in small amounts (*Ensuring no soft centres to baked goods, must be thoroughly cooked)

*For store bought baked goods check where milk appears on the ingredient list, ensure it is 3rd or lower order ingredient

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Food Re-introduction



Skin tests by dabbing or smearing foods on skin are no longer recommended since infant's skin is sensitive and many will develop a rash which is unlikely to be due to food allergy

(http://www.allergy.org.au/images/pcc/ASCIA_guidelines_infant_feeding_and_allergy_prevention.pdf)

Extensively Hydrolysed & Soy Formula

- 1st line:
 - ≤ 6 month
 - ≥ 6 months & poor growth Or Soy for >6 months
- 2nd line if soy not tolerated
- GP must consult Paediatrician or Specialist before prescribing
- AllerPro available OTC



Managing CMPA in formula fed infants

- Amino Acid (elemental) formula is the 1st choice for
 - anaphylaxis
 - eosinophilic oesophagitis (EoE)
 - Enteropathy
 - Failure to thrive



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Useful clinical tool the GiDi App: <http://gidiapp.com/>



GiDiApp

GiDiApp has been developed by a group experts and Key Opinion Leaders in the fields of Nutrition and Gastroenterology. It is designed to support health care professionals in their management of functional gastro-intestinal disorders (FGIDs) and symptoms associated with cow's milk protein allergy (CMPA).

The App is developed on the basis of a consensus paper co-authored by 20 key-opinion leaders, discussing the available evidence and proposing practical algorithms. This application is not intended to be a substitute for medical advice from a health care professional.

The information made available on this application is not intended in any way to replace the relationship between doctor and patient.

How to install GiDiApp on your computer:

Mixed reactions IgE & Non-IgE: Eosinophilic Oesophagitis (EOE) Signs/ symptoms EOE

- Dysphagia
- Food impaction
- Vomiting/ reflux
- Chest/ abdominal pain
- Difficulty feeding
- Decreased appetite
- Poor weight gain



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Management of EoE in the infant

- Medications: ASCIA advises PPIs, oral low dose steroid
- Elemental diet effective in 88% older children
- Dietary 6FE is common and effective (CMP, soy, egg, wheat, peanuts & tree nuts, fish & shellfish) for 74%
- Evidence emerging for elimination of rye, corn, chicken & beef in addition to 6FE
- Elemental diets where appropriate

Dietary management of EoE in the breastfed infant

- No specific research on maternal dietary elimination for EoE in fully breastfed infants, however, some evidence suggesting usefulness of CMPA elimination diet for symptoms suggestive of allergy in breastfed infants



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Dietary management of EoE in the older infant

- ASCIA guidelines 2014, 6FE diet with rye, corn, chicken & beef eliminated
- Targeted elimination of suspicious foods, commonly, CMP, egg, soy, wheat, should be individualised, re-introduction, as above
- Elemental diet where appropriate



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Non-IgE mediated food protein induced syndromes (FPIES, FPIAP) & Enteropathies

	FPIES	FPIAP	Enteropathy
Age of onset	Infancy	Newborn-6 months	Infant/Toddler
Duration	12-24 months	<12 months	2 -24 months
Symptoms	Vomiting, FTT, Shock (15-20%), lethargy severe diarrhoea, bloody stools, oedema (acute)	Bloody stools, non-systemic symptoms	Vomiting, diarrhoea oedema (moderate), FTT

Nowak-Wegrzyn et al 2015, Caubet & Nowak-Wegrzyn, 2011

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Dietary management of FPIES

- ASCIA advice (2015):
 - Usually one food trigger, therefore no need for multiple FE diet
 - Rarely occurs in breastfed infants
 - Common food allergens are CMP, rice, oats, soy and egg
 - Strict avoidance of known food allergen responsible for FPIES reaction
- Recent paper (Nowak-Wegrzyn et al 2015) advises:
 - Mothers of BF infants to avoid the known food allergen
 - eHf or Elemental formula is appropriate

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Australian Guidelines

- 2008: Kemp et al.
 - Guidelines for the use of infant formulas to treat cows milk protein allergy: an Australian consensus panel opinion
 - 2009: Allen et al.
 - Management of cow's milk protein allergy in infants and young children: an expert panel perspective
 - 2016: ASCIA infant feeding advice – March following publication of SR by Boyle et al 2016 and May 2016
- <http://www.allergy.org.au/patients/allergy-prevention>

ASCIA 2016 Advice March 2016

- Up to 3 serves of oily fish per week during pregnancy and breastfeeding may be beneficial in preventing eczema in early life.
- There is no consistent, convincing evidence to support that hydrolysed formulas (usually labelled HA or hypoallergenic) assists in allergy **prevention** in infants or children.

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ASCIA 2016 Advice March 2016

- There is evidence that for infants at high risk of food allergies, such as those with severe eczema or who already had a food allergy reaction to egg, **introduction of regular peanut before 12 months** of age can reduce subsequent peanut allergy.
- It is not recommended that infants are fed raw egg, however there is moderate evidence for the **introduction of cooked egg into the diet of infants with a family history of allergy before 8 months** of age to try and reduced the risk of egg allergy.

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ASCIA Infant feeding and allergy prevention: May 2016

- When your infant is ready, at around 6 months, but not before 4 months, start to introduce a variety of solid foods, starting with iron rich foods, while continuing breastfeeding.
- All infants should be given allergenic solid foods including peanut butter, cooked egg and dairy and wheat products in the first year of life. This includes infants at high risk of allergy.
- Hydrolysed (partially and extensively) infant formula are not recommended for prevention of allergic disease.

First Foods - Timing

- WHO (2012) recommend exclusive breastfeeding **for 6 months**, then BF to continue until 2 yrs of age and beyond
- NHMRC recommend initiating solids **around 6 months**, with iron-rich foods (eg, fortified rice cereals)
- ASCIA states that the time window for the child to develop immunological gut tolerance begins from ~4 months of age, they recommend
 - Introducing solids **between 17 weeks-6 months, but NOT before 16 weeks**, for potential benefits in reducing risk of some food allergies
 - Relaxing food group avoidance

First Foods NHMRC 2012

Commencing with Iron rich foods, then in no particular order, all major proteins in from 'around' 6 months of age. No need for slow progression

- Iron fortified infant cereal & other iron rich foods including:
 - Meats, ie, red & white
 - fish
 - Legumes
- Vegetables
- Wheat
- Fruits
- Eggs
- Nut meals & butters



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First Foods NHMRC 2012

- Acknowledgment of some evidence for increased risk of allergy by delaying solid food introduction after 6 months
- Acknowledgment of evidence for decreased risk of allergy by introducing solids before 6 months by no earlier than 4 months



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Evidence for introducing solids 4-6 months

- Nwaru et al 2013:
 - early introduction of wheat, rye, oats, barley, fish, egg decreases the risk of asthma, allergic rhinitis and atopic sensitisation
- DuToit et al 2015:
 - Early introduction to peanut in high risk infants decreased their risk for peanut allergy
- Dr Normal Swan's recent Interview with Prof Katie Allen:
http://mpegmedia.abc.net.au/rn/podcast/2016/03/hrt_20160307_1730.mp3

Further information

Australasian Society of Clinical Immunology and Allergy

ASCIA website: www.allergy.org.au includes:

- Childcare & schools: <http://www.allergy.org.au/schools-childcare>
- EoE: <http://www.allergy.org.au/patients/food-other-adverse-reactions/eosinophilic-oesophagitis>
- FPIES: <http://www.allergy.org.au/patients/food-other-adverse-reactions/food-protein-induced-enterocolitis-syndrome-fpies>
- 2016 Infant Feeding Advice:
<http://www.allergy.org.au/patients/allergy-prevention>

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References:

- Boyce et al 2010. Guidelines for the Diagnosis and Management of Food Allergy in the United States: Summary of the NIAID-Sponsored Expert Panel Report. *Journal of Allergy and Clinical Immunology* 126:6:1105-1118
- Allen, K & Koplin, J The Epidemiology of IgE-Mediated Food Allergy and Anaphylaxis. *Immunol Allergy Clin N Am* 32 (2012) 35–50
- Sampson et al 2014: Food allergy: A practice parameter update 2014. *Journal of Allergy & clinical Immunology* 2014:134:1016-25
- Muraro et al 2014 EAACI Food Allergy and Anaphylaxis Guidelines: diagnosis and management of food allergy. *Allergy*:69:1008-1025
- Peters et al 2013. Skin Prick test responses and allergen-specific IgE levels as predictors of peanut, egg and sesame allergy in infants. *Journal of Allergy and Clinical Immunology Oct 2013*:132:874-80.
- Steifel & Roberts 2012. How to use serum specific IgE measurements in diagnosing and monitoring food allergy. *Arch Dis Child Education & Pract edition* 2012:97:29-36
- Turnbull et al 2015 Review article: the diagnosis and management of food allergy and food intolerances. *Alimentary Pharmacology and Therapeutics* 41:3-25
- Venter et al 2013. Diagnosis and management of non-IgE-mediated cow's milk allergy in infancy - a UK primary care practical guide. *Clinical and Translational Allergy* 2013, 3:23
- Caubet & Nowak-Wegryzn (2011). Current understanding of the immune mechanisms of food protein-induced enterocolitis. *Expert Review of Clinical Immunology* 7:3:317-327
- Nowak-wegryzn et al 2015. Non-IgE mediated gastrointestinal food allergy. *Journal Allergy and Clinical Immunology*, May 015: 135: 1114-24
- Sicherer 2001. Clinical implications of cross-reactive food allergens. *Journal of allergy and clinical immunology* 2001:108:881-890
- Vandenplas et al 2015. Algorithms for managing infant constipation, colic, regurgitation and cow's milk allergy in formula-fed infants. *Acta Paediatrica* 104: 449-457
- Groetch & Nowak-Wegrzyn 2013. Practical approach to nutrition and dietary intervention in pediatric food allergy. *Pediatric Allergy & Immunology* 24:212-221
- Heine et al 2011. Emerging management concepts for eosinophilic esophagitis in children. *Journal of Gastroenterology and Hepatology* 26:1106-1113

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References:

- Vandenplas et al 2015: Prevalence and Health Outcomes of Functional Gastrointestinal Symptoms in Infants From Birth to 12 Months of Age. *JPGN* :61:5:531-537
- Harb et al 2015. Infant Colic – What works: A Systematic Review of Interventions for Breastfed Infants. *Journal of Pediatric Gastroenterology and Nutrition* (in press) accepted 10 Dec 2015: DOI:10.1097/MPG.0000000000001075
- Sung et al 2014. Treating infant colic with the probiotic *Lactobacillus reuteri*: double blind, placebo controlled randomised controlled trial. *BMJ (Clinical Research)* 2014:348-g2107
- Chang et al 2016. Synbiotics for Prevention and Treatment of Atopic Dermatitis A Meta-analysis of Randomized Clinical Trials. *JAMA Pediatrics*: 170:3:236-242
- Lemon-Mule et al 2008. Immunologic changes in children with egg allergy ingesting extensively heated egg. *Journal of allergy and clinical immunology* 2008:122:977-83
- Clarke et al 2011. A longitudinal study of resolution of allergy to well cooked and uncooked egg. *Clinical and Experimental Allergy* 2011: 41:706-12
- Leonard et al 2012 Dietary baked egg accelerates resolution of egg allergy in children. *The Journal of allergy and clinical immunology*, 130, 473-80 e1.
- Kemp et al 2008 Guidelines for the use of infant formulas to treat cows milk protein allergy: an Australian consensus panel opinion. *MJA* 188:21:109-112
- 2009: Allen et al 2009. Management of cow's milk protein allergy in infants and young children: an expert panel perspective. *Journal of Pediatrics and Child Health* 45:9:481-486
- ASCIA infant feeding advice 2010: <http://www.allergy.org.au/health-professionals/papers/ascia-infant-feeding-advice>
- WHO (2012) Infant and young child feeding : model chapter for textbooks for medical students
- and allied health professionals.
- National Health and Medical Research Council (2012) *Infant Feeding Guidelines*. Canberra: National Health and Medical Research Council.
- Nwaru et al 2013. Timing of infant feeding in relation to childhood asthma and allergic diseases. *Journal Allergy & Clinical Immunology* 2013:131:78-86
- DuToit et al 2015. Randomized Trial of Peanut Consumption in Infants at Risk for Peanut Allergy. *New England Journal of Medicine*:372:9:803-813
- Boyle et al 2016. Hydrolysed formula and risk of allergic or autoimmune disease:systematic review and meta-analysis. *BMJ*: 2016;352:i974 <http://dx.doi.org/10.1136/bmj.i974>

A stylized illustration on a light green background. In the center, a white plate with a fork on the left and a knife on the right is shown. On the plate, there are two stylized human figures: a blue one on the left and a pink one on the right, both with their arms raised in a celebratory or healthy pose. The text 'Any questions, comments?' is written in black, cursive font across the middle of the figures.

Any questions, comments?

Thank you 😊

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