



Nutritional Management of

Allergies



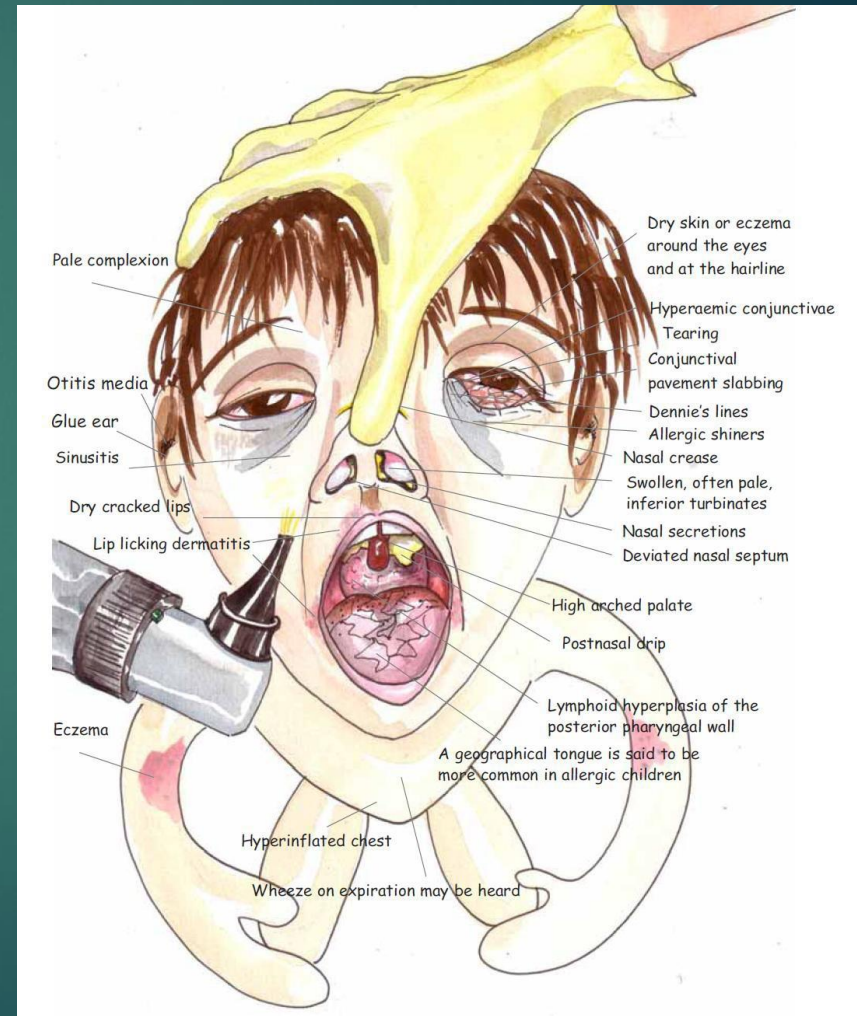
Outline

- Definitions
- Etiology
- Types of reactions and pathophysiology
- Nutritional Care Process
- Medical Nutrition Therapy
- Preventing Food Allergy

The allergic child

- Food allergy:
 - > 6 – 7 % in children
 - > 1 – 2% in adults

(After an Oral Food Challenge)



Food Allergy Prevalence

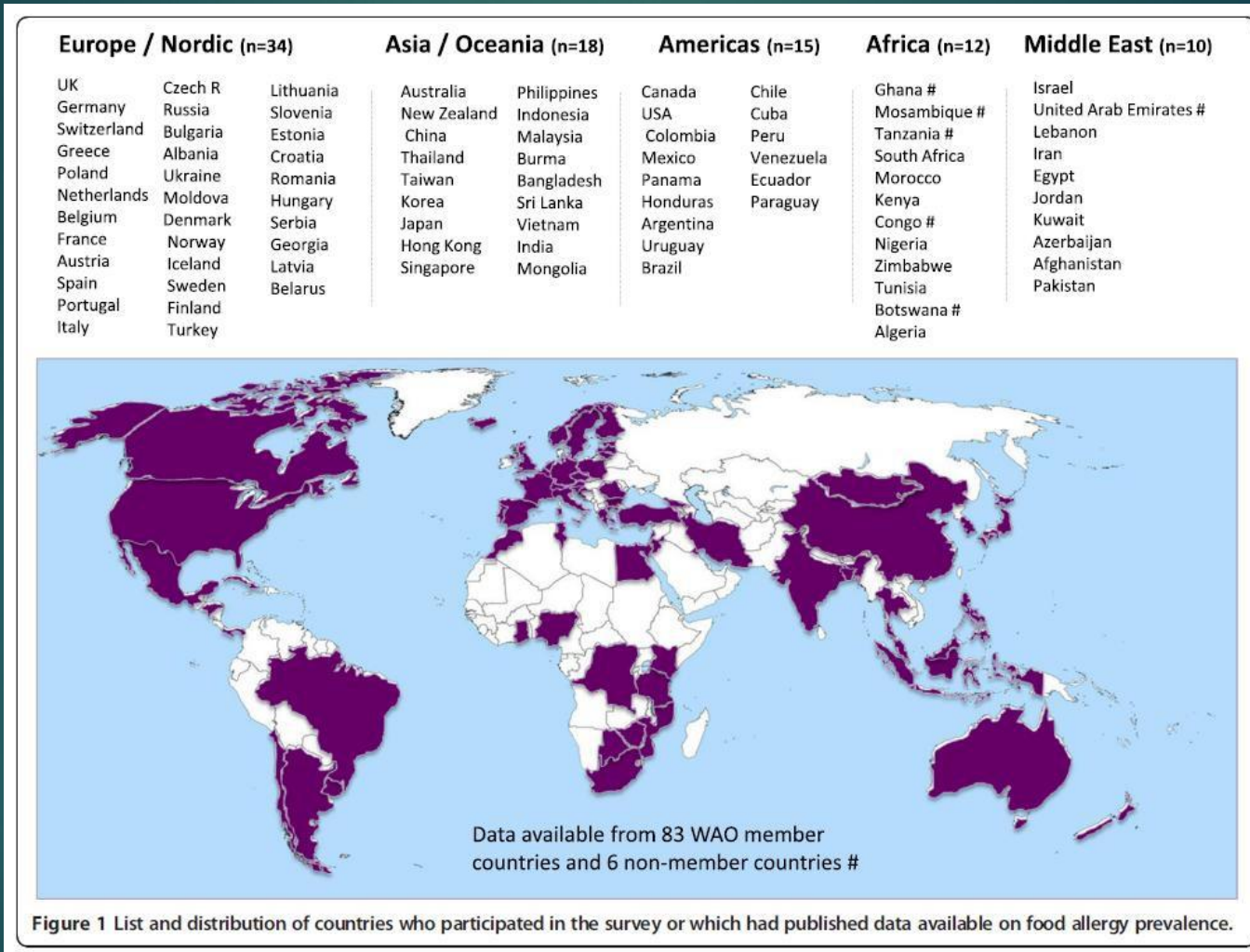


Figure 1 List and distribution of countries who participated in the survey or which had published data available on food allergy prevalence.

Food Allergy Prevalence

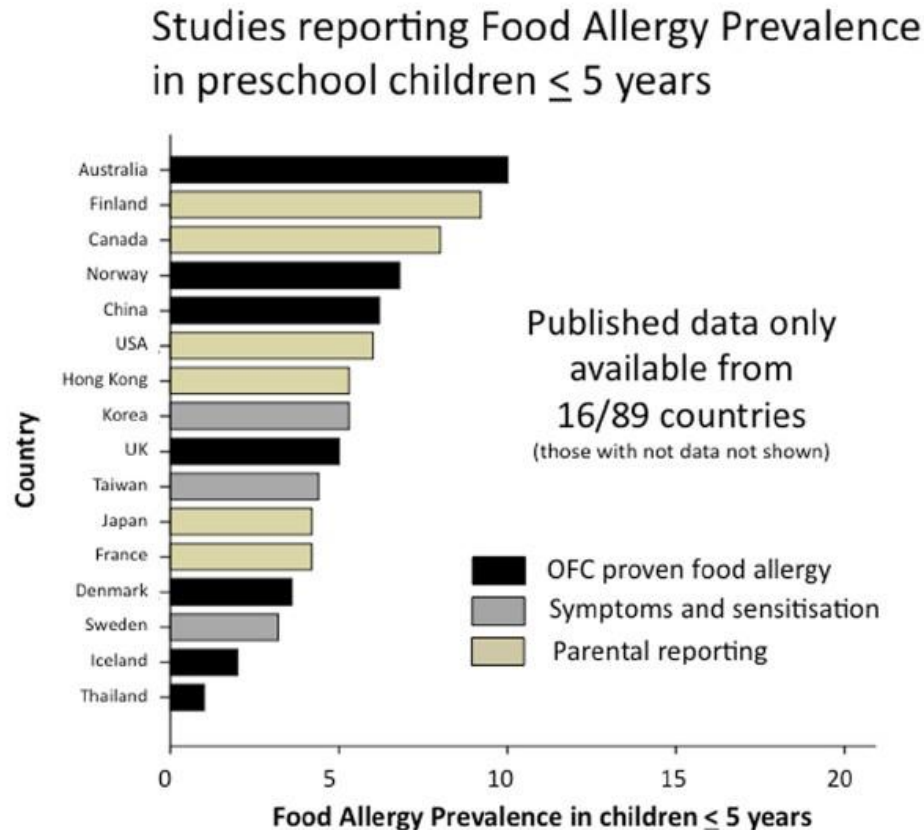


Figure 2 Summary of food allergy prevalence from studies that provided data for children aged 5 years or less. Studies are categorised according to level of evidence; OFC proven food allergy (black bars); food allergy based on symptoms and sensitisation (grey bars) or questionnaires/parental reporting (yellow bars).

Food Allergy Prevalence

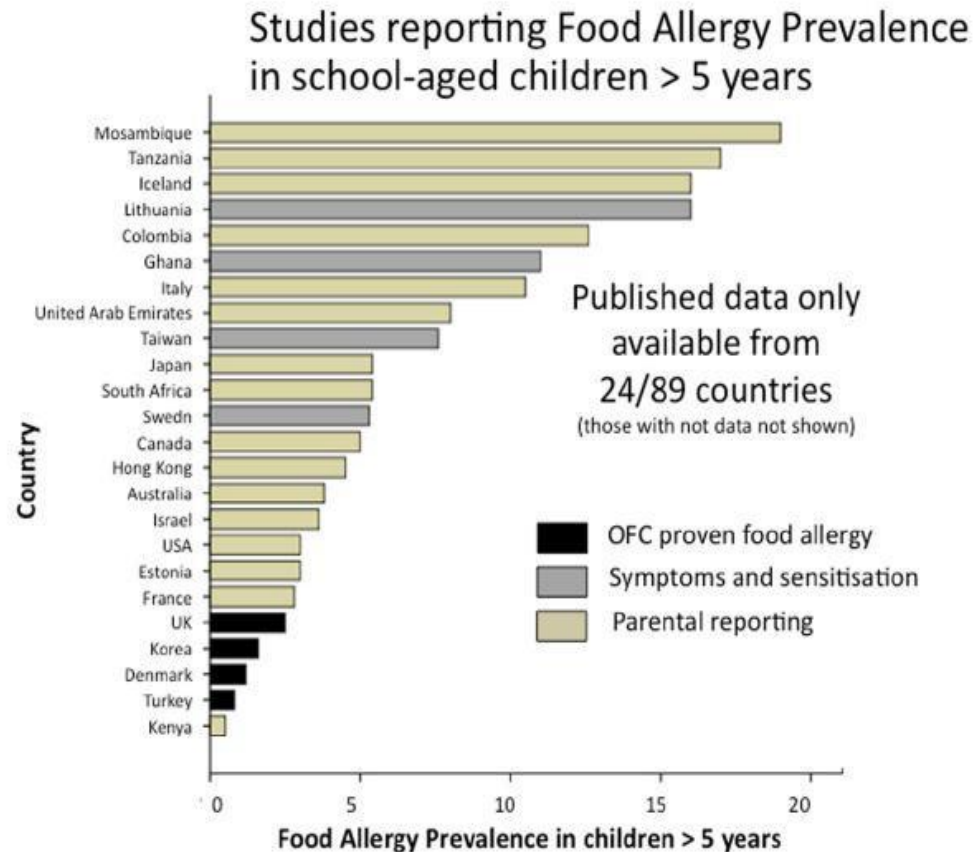



Figure 3 Summary of food allergy prevalence from studies that provided data for children older than 5 years. Studies are categorised according to level of evidence; OFC proven food allergy (black bars); food allergy based on symptoms and sensitisation (grey bars) or questionnaires/parental reporting (yellow bars).

- 
- ⦿ Nausea
 - ⦿ Eczema
 - ⦿ Asthma
 - ⦿ Hypotension
 - ⦿ Irritable bowel syndrome
 - ⦿ Itching
 - ⦿ Diarrhoea



◎ Adverse reactions to food:

Encompass both food allergies and food intolerances, both of which can result in distressing symptoms and adversely affect health.

Definitions

- Food sensitivity:

“...refers to an adverse reaction to food or component of the food when it is not clear whether the reaction is due to food allergy or intolerance.”

Definitions

- Food allergy:

“.....is an adverse immune mediated reaction to a food, usually a food protein. The symptoms are caused by the individual's unique response to the food, not by the food itself.”

- Food intolerance:

“...is an adverse reaction to a food that does not involve the immune system and occurs because of the way the body processes the food or components in the food.”

Definitions

- Sensitisation:

“...is the first exposure of the immune system to the allergen and there are no symptoms of reaction.

Thereafter, whenever that same foreign material enters the body, the immune system responds to this threat in the same manner.”

Definitions

- Tolerance:

“Food comes from foreign matter, either plant or animal, that our immune systems typically perceive as ‘foreign but safe’ as a result of a process of oral mucosal tolerance that occurs when we digest and absorb food.

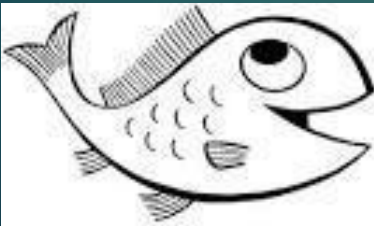
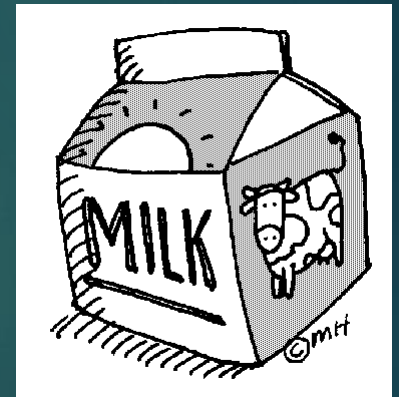
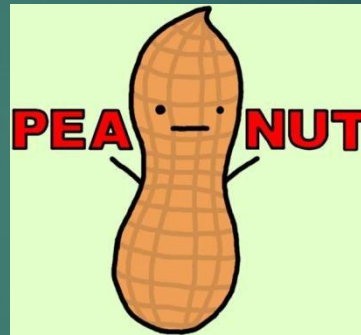
Tolerance indicates that an individual is clinically and immunologically tolerant of the food.”

Symptoms of Food Allergy

- ⦿ Gastrointestinal
- ⦿ Skin and mucous membranes
- ⦿ Respiratory
- ⦿ Ears, nose and throat
- ⦿ Systemic
- ⦿ Nervous system
- ⦿ Other

Etiology

Common food allergens



Etiology

Amount of antigen present

Genetics

History of atopy

Microflora imbalance

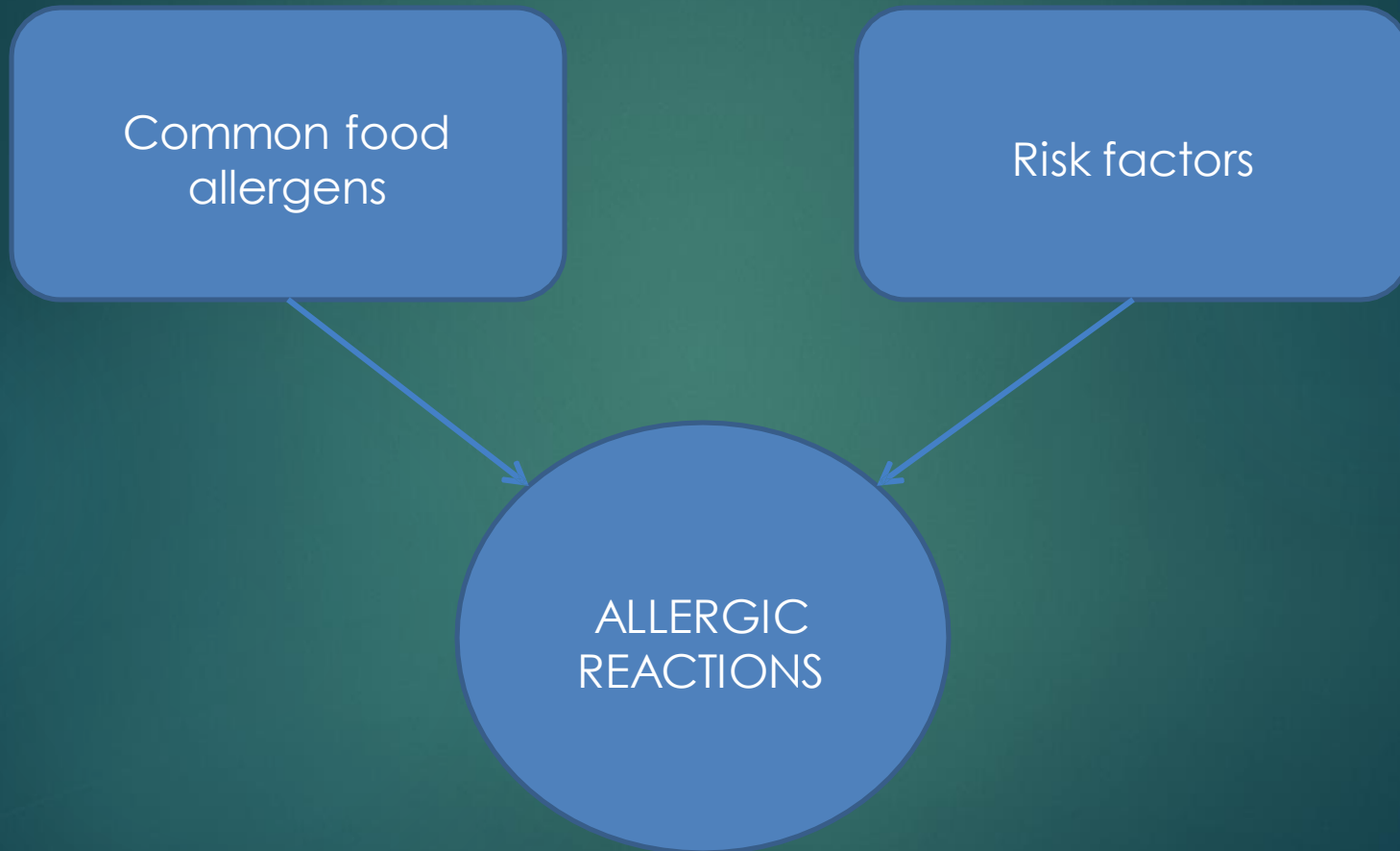


GI permeability

Antigen exposure

Environmental factors

Etiology



The GI and the microbiome

GI function and ability to prevent the inappropriate passage of molecules through the intestinal wall is key to oral tolerance and food allergy.

Microbiota is essential.

Microbiome – collection of genes of bacteria on skin and in GI.

The GI and the microbiome

Dysbiosis: imbalance in microbiota which leads to increased intestinal permeability. Result of:

- * C/S
- * Lack of BF
- * Antibiotics
- * Chronic stress
- * Infections

Types of reactions

Cell-mediated

Mixed IgE and non-IgE
mediated



ALLERGIC
REACTIONS

Pathophysiology

- ◎ IgE-mediated immunity:
 - ▶ The allergen binds with sensitised IgE antibodies on mast cell or basophils.
 - ▶ Upon binding, chemical inflammatory mediators are released from the cell.

Types of reactions

Rapid in onset, occurring within minutes to hours of exposure

- Systemic
- GI
- Cutaneous
- Respiratory



ALLERGIC
REACTIONS

◎ IgE-mediated immunity:

- ▶ Oral allergy syndrome
- ▶ Immediate GI hypersensitivity
- ▶ Allergy to Latex
- ▶ Food-dependent, exercise induced anaphylaxis

Pathophysiology

- Cell-mediated immunity:

T-cells interact directly with the antigen and release inflammatory mediators

Types of reactions

Cell-mediated

Delayed onset of more than 2 hours

- GI
- Cutaneous
- Respiratory



ALLERGIC
REACTIONS



◎ Cell-mediated immunity:

- > Eosinophilic esophagitis
- > Eosinophilic gastro-enteritis

Pathophysiology

- Mixed IgE- and Non-IgE-mediated immunity:
 - > Both antibodies and T-cells are associated with triggering inflammatory mediators and the development of symptoms.

Types of reactions

Mixed IgE and non-IgE mediated

Delayed onset of more than 2 hours

- GI
- Cutaneous
- Respiratory



ALLERGIC
REACTIONS



© Mixed IgE- and Non-IgE-mediated immunity:

- > Coeliac disease
- > Food protein-induced enterocolitis syndrome

Common allergens

- Egg – Ovumucoid (Egg white) heat stable so avoid eggs. Ovalbumin and conalbumin if positive can still use baked egg products. Lysozyme and egg serum albumin – egg yolk
- Fish – Parvalbumin – heat stable – More in codfish lower in tuna
- Shell fish allergy is the best indicated by the shrimp allergen component Pen m 2 (Tropomyosin in muscle protein).
- Milk – Casein (Heat stable), Alactalbumin and B-lactoglobulin (Whey). BSA occurs in milk and red meat (Heat sensitive) Lactoferrin – use as preservative in meat.
- Peanut - storage protein is Ara h 1,2, 3 and 5. They are heat stable.
- Wheat (Omega 5 gliadin) – Anaphylaxis – Bakers or exercise asthma

Nutrition Care Process

- ◉ **A**ssessment
- ◉ **D**iagnosis
- ◉ **I**ntervention
- ◉ **M**onitoring
- ◉ **E**valuation



Nutrition Assessment

● **Assessment**

- Anthropometry
- Biochemistry
- Clinical
- Dietary
- Medication

Clinical and dietary assessment

IMPORTANT CONSIDERATIONS in TAKING an ALLERGY HISTORY



The presenting complaint

SYMPTOMS

Cough, wheeze, shortness of breath, nasal itch, rhinorrhoea, sneezing, congestion...

DIFFERENTIAL DIAGNOSIS

Consider other causes for the symptoms



Regular follow up is important
Good attitude and teamwork are essential for success in management

Medic alert



Level of education
Socio-economic status
Access to health care



Geographic location

Allergens are different in different areas.
A history of relocation may be relevant



All asthmatics need a written emergency plan



Medications currently used.
Check compliance and technique



Other medical conditions and other medications



Family history
Genetic factors are important



Allergic march
Ask about childhood eczema



Clinical and dietary assessment

Diet

Milk

Effort tolerance

Sports and exercise

Sleep patterns

Other manifestations of atopy

Pets

Occupation and hobbies

Does your patient work or play with potentially sensitising substances?

Triggers like smoking, pollens, animal dander, house-dust mite, moulds, temperature changes, emotion and respiratory infections

Living environment

The collage features various icons: a colorful fish, an ice cream cone, a milk bottle, a carrot, a person with a large 'A' on their chest, a crescent moon and stars, a black cat, a house-dust mite, a paint bucket and brush, a flower in a pot, a person's face, a box of latex gloves, a spider, a lit cigarette, and pink flowers.

Link symptom with allergen

- Protein (Profilin - PR-10 or Lipid transfer protein –LTP) important in adults
- Symptoms
 - Skin (egg white, nuts, berries, sea food, citrus and tomatoes)
 - Respiratory (milk, wheat, pollen, preservatives, citrus)
 - GIT (wheat, fruit, vegetables, preservatives)
- Factors that can influences the symptoms
 - Heat like eggs and oils (cold press oils)
 - Specific protein like whey not casein
 - Cross reactions like wheat and grass/ shell fish and dust mites or cockroaches. Peanuts and nuts and legumes. Latex to banana, avo, papaya and kiwi)
 - Nutritional Supplements

Biochemistry

- ◎ **Skin-Prick test (SPT)**

1. A drop of antigen is placed on the skin
2. Skin punctured or scratched
3. Specific IgE assessed

- ◎ **Food allergen-specific IgE testing (RAST)**

1. Immunoassay of serum IgE levels

Nutrition Diagnosis

- Identify & label problem?
- Determine cause or risk factors
- Signs and symptoms

Nutrition Intervention

◎ Confirming medical diagnosis

- Food and symptom diary
- Food-elimination diet
- Oral food challenge – **GOLDEN standard**
 - Double-blind, placebo-controlled food challenge
 - Single-blind food challenge
 - Open oral food challenge
 - Food elimination diet

Nutrition Monitoring & Evaluation

- ① **Monitor progress**
- ② **Measure outcomes**
- ③ **Evaluate outcomes**

Cow's milk allergy

◎ Assessment

- > Clinical and diet history
- > Symptoms

IgE-mediated

- SPT and/or RAST
- Immediate symptoms:
 - Anaphylaxis
 - Angioedema
 - Rhinitis
 - Sinusitis

◎ Assessment

> Clinical and diet history

> Symptoms

Cell-mediated

- Elimination diet or OFC
- Delayed symptoms:
 - Dermatitis
 - FPIES

Cow's milk allergy

- ◎ **D**iagnosis
 - > Poor nutritional intake
- ◎ **I**ntervention
 - > Elimination diet
- ◎ **M**onitoring & Evaluation
 - > Efficacy

Preventing Food Allergy

- ◎ Breastfeeding – liquid gold
 - ▶ Role of colostrum
 - ▶ Immune development
 - ▶ Oral tolerance
 - ▶ Reinforce gut-epithelial barrier

Preventing Food Allergy



- ◎ Allergen exposure
 - > Improved tolerance and sensitisation during pregnancy and in breast milk

Preventing Food Allergy



- ◎ Introduction to solids
 - > Induce tolerance between 4 and 7 months
 - > Exposure to allergens before 7 months
- ◎ Early diet and immunomodulatory factors
 - > Variety of events and agents – incompletely understood
 - > Intestinal microbiota important

Preventing Food Allergy

⦿ Antioxidants

- ▶ Diets high in carotenoids, vit C, vit E, Zn, Se
- ▶ Pregnancy intake reduces risk

⦿ Vit D

- ▶ Suboptimal vit D status in a critical period increases susceptibility to abnormal colonization of intestinal flora
- > Early correction of deficiency

Preventing Food Allergy



- ◎ Folate

- > Association between maternal folate exposure late in pregnancy

- ◎ PUFAs

- > Supplementation in pregnancy may reduce development
- > Further studies needed

Preventing Food Allergy

- Pre-and probiotics
 - ▶ Supplementation in pregnancy and early infancy may reduce development
 - ▶ Strain, timing, dose, environmental factors need to be investigated

