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Food allergy

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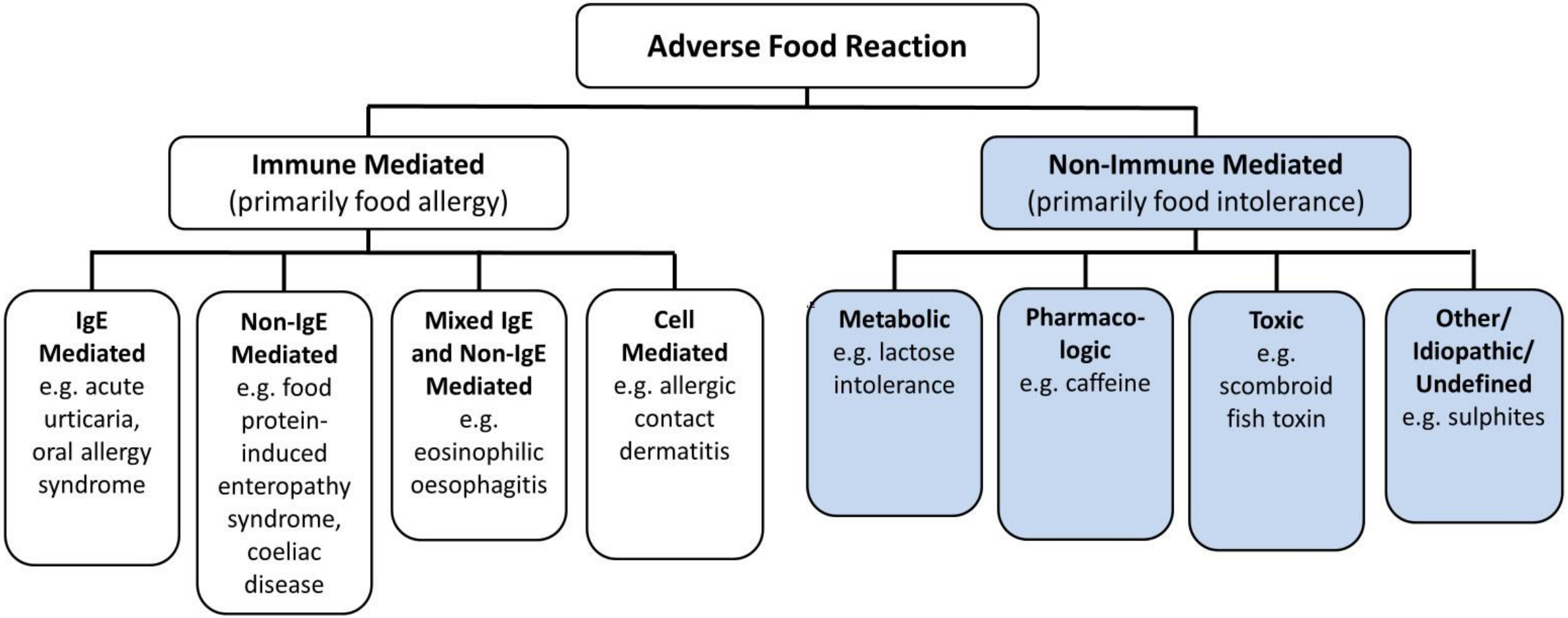
JUNE 2021

- An adverse food reaction is a general term for **any untoward response** to the ingestion of a food.

- Adverse food reactions can be divided into food allergies, which are **immunologically** mediated, and all other reactions, which are nonimmunologic.



- The term **"food allergy"** refers to an abnormal **immunologic reaction** to a food that results in the development of symptoms on exposure to that food.

- This clinical reactivity is assessed by **history or challenge.**

- Such reactions can be mediated by **IgE molecules** directed against specific food proteins that activate **mast cells and basophils** or can arise from other cellular processes involving **eosinophils or T cells**.

- Adverse food reactions are common and often assumed by patients to be allergic in nature.

- However, **nonimmunologic reactions** to food **are more common** than true food allergies

- **Food allergy** most often begins **in the first two years of life.**

Manuka Biotic

Common Food Allergens

Gluten & Wheat

Cow's Milk

Eggs

Peanuts

Soy Products

Tree Nuts

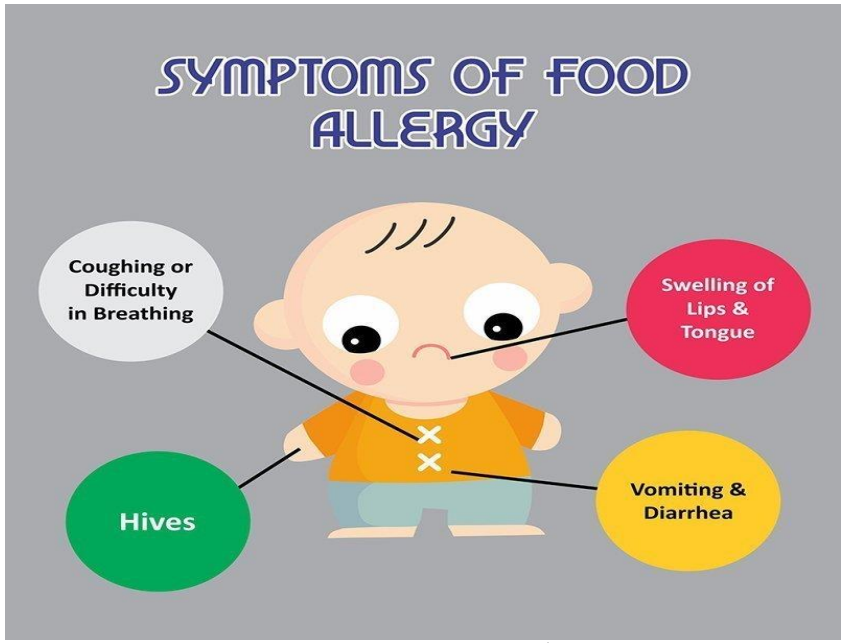
Seafood

Shellfish

- The term "sensitization" : the presence of IgE directed against a specific antigen (a "positive" test), as detected by **in vivo** (skin prick testing [SPT]) or **in vitro** (fluorescent-enzyme immunoassay [FEIA]) testing.

- However, a patient who is sensitized to a particular food may not be clinically reactive upon exposure to the food.

- ALLERGY



- Food sensitization and/or allergy occur in approximately **5 to 10 percent** of young children, with peak prevalence at approximately one year of age.

- Prevalence then falls progressively until late childhood, after which it remains stable at approximately 3 to 4 percent

Kids & Food Allergies: What You Need To Know

1 in 13 children in the U.S. has a food allergy...

That's roughly 6 million children.

That's about **2 kids** in every classroom.

More than 15% of school aged children with food allergies have had a reaction in school.

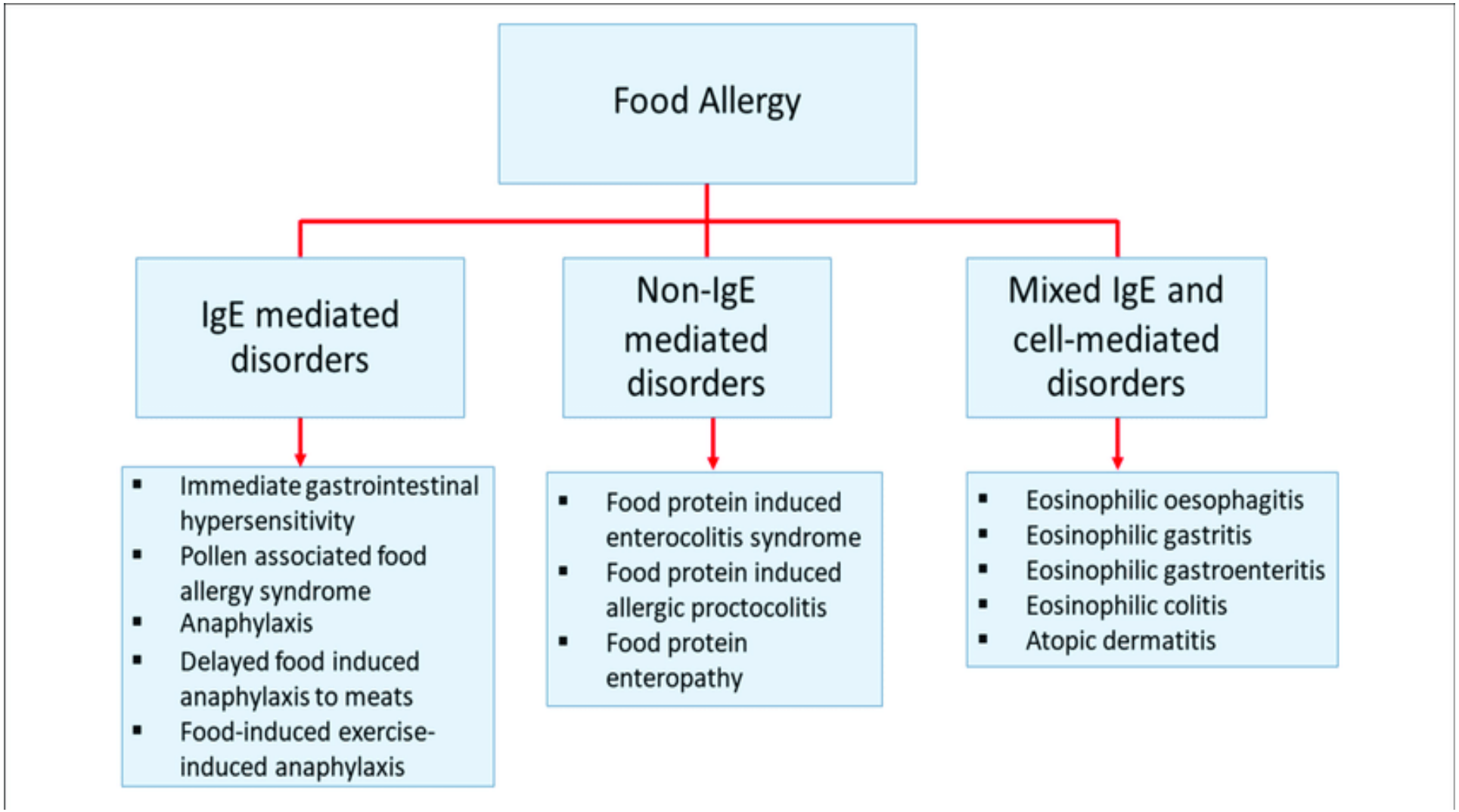
A food allergy occurs when the immune system targets a food protein and sets off a reaction throughout the body.

Food allergy is an IgE-mediated immune reaction and is not the same as a food intolerance or sensitivity. It occurs quickly and can be life-threatening.

IgE, or Immunoglobulin E, are antibodies produced by the immune system.

IgE antibodies fight allergenic food by releasing chemicals like histamine that trigger symptoms of an allergic reaction.

- Young children who are sensitized to foods or have confirmed IgE-mediated food allergy are more likely than their nonallergic peers to develop allergic rhinitis and asthma later on.



IgE-MEDIATED REACTIONS

- rapid in onset,
- typically beginning within minutes to two hours from the time of ingestion.
- an exception :
- IgE-mediated reactions to carbohydrate allergens in meats,
- mainly in adults
- these reactions begin four to six hours after ingestion.

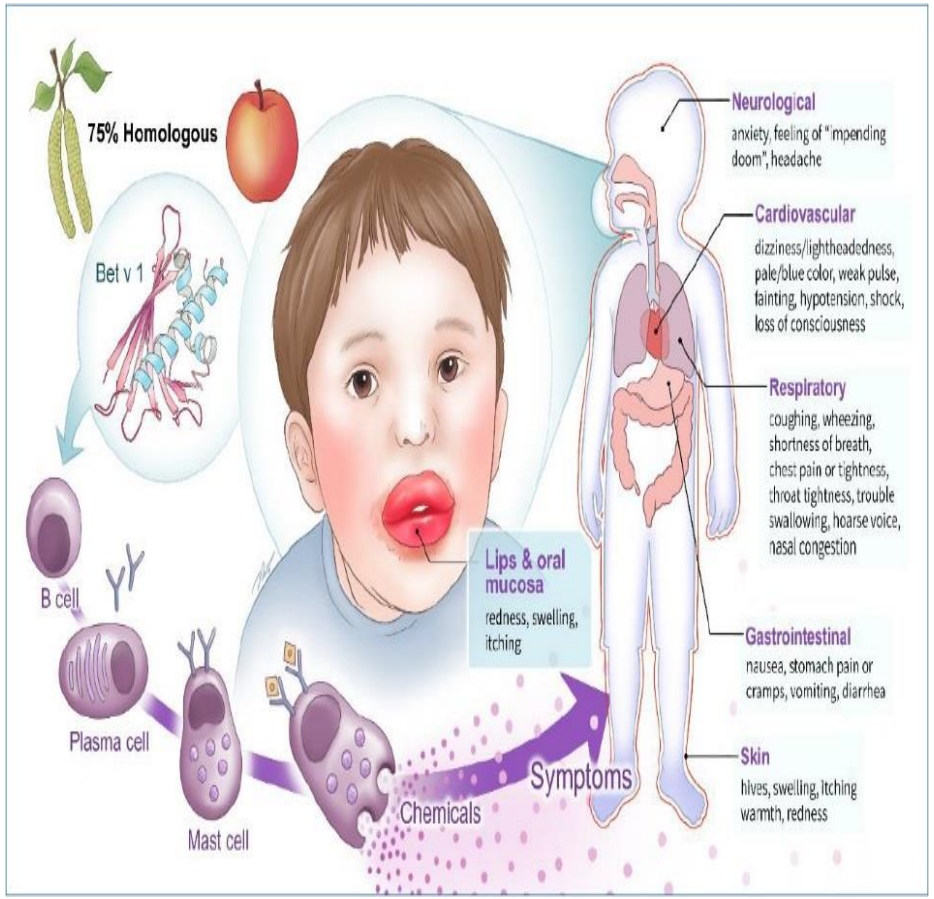
FOOD ALLERGY SIGNS AND SYMPTOMS

ARE FRUITS AND VEGGIES MAKING YOUR MOUTH ITCHY?

You may have oral allergy syndrome (OAS).

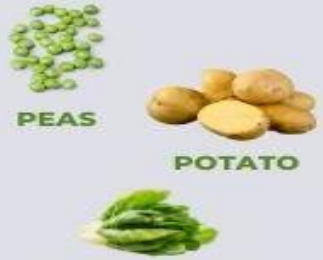
➢ Oral allergy syndrome (pollen-associated food allergy syndrome)

- ✓ **IgE-mediated** hypersensitivity
- ✓ HISTORY : birch and ragweed pollen–induced allergic rhinitis.
- ✓ Symptoms: confined to the oropharynx
- ✓ the rapid onset of oral pruritus; tingling and angioedema of the lips, tongue, palate, and throat; and occasionally a sensation of pruritus in the ears and **tightness in the throat.**



- Symptoms are generally short lived and are caused by local mast cell activation following contact with fresh raw fruit and vegetable proteins that cross-react with:
- birch pollen (apple, carrot, potato, celery, hazel nuts, peanuts, kiwi, cherry, pear),
- grass pollen (potato, tomato, watermelon, kiwi),
- **ragweed pollen** (banana, melons such as watermelon and cantaloupe).

CROSS-REACTORS

ENVIRONMENTAL ALLERGEN	FRUITS	VEGETABLES	SPICES	OTHER FOODS
TREES (typically birch)				
GRASS				
RAGWEED (pollinates in autumn)				

Nutrition Dynamix
Melissa Karch, RDN, LD, CLT

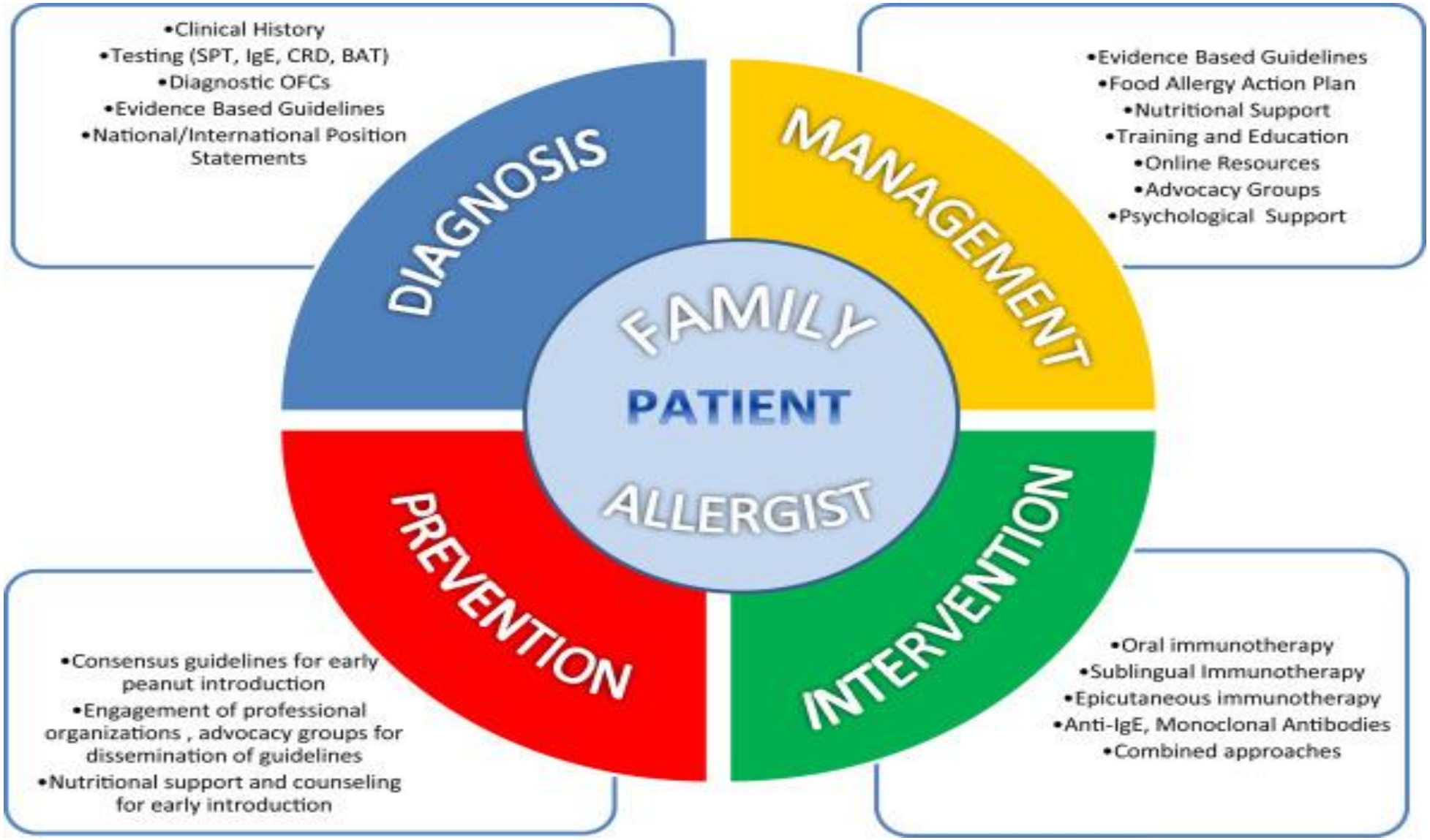
- Certain food allergies, such as those to **cow's milk and hen's egg**, are usually outgrown during childhood or adolescence, whereas peanut and tree nut allergies are more likely to persist into adulthood or may develop in later childhood or adulthood.

Table 176.3 Natural History of Food Allergy and Cross-Reactivity Between Common Food Allergies

FOOD	USUAL AGE AT ONSET OF ALLERGY	CROSS REACTIVITY	USUAL AGE AT RESOLUTION
Hen's egg white	0-1 yr	Other avian eggs	7 yr (75% of cases resolve)*
Cow's milk	0-1 yr	Goat's milk, sheep's milk, buffalo milk	5 yr (76% of cases resolve)*
Peanuts	1-2 yr	Other legumes, peas, lentils; coreactivity with tree nuts	Persistent (20% of cases resolve)
Tree nuts	1-2 yr; in adults, onset occurs after cross reactivity to birch pollen	Other tree nuts; co-reactivity with peanuts	Persistent (9% of cases resolve)
Fish	Late childhood and adulthood	Other fish (low cross-reactivity with tuna and swordfish)	Persistent†
Shellfish	Adulthood (in 60% of patients with this allergy)	Other shellfish	Persistent
Wheat*	6-24 mo	Other grains containing gluten (rye, barley)	5 yr (80% of cases resolve)
Soybeans*	6-24 mo	Other legumes	2 yr (67% of cases resolve)
Kiwi	Any age	Banana, avocado, latex	Unknown
Apples, carrots, and peaches§	Late childhood and adulthood	Birch pollen, other fruits, nuts	Unknown

Table 176.6 Clinical Implications of Cross-Reactive Proteins in IgE-Mediated Allergy

FOOD FAMILY	RISK OF ALLERGY TO ≥1 MEMBER (%; approximate)	FEATURE(S)
Legumes	5	Main causes of reactions are peanut, soybean, lentil, lupine, and garbanzo (chickpea).
Tree nuts (e.g., almond, cashew, hazelnut, walnut, brazil)	35	Reactions are often severe.
Fish	50	Reactions can be severe.
Shellfish	75	Reactions can be severe.
Grains	20	
Mammalian milks	90	Cow's milk is highly cross-reactive with goat's or sheep's milk (92%) but not with mare's milk (4%).
Rosaceae (pitted fruits)	55	Risk of reactions to >3 related foods is very low (<10%); symptoms are usually mild (oral allergy syndrome).
Latex-food	35	For individuals allergic to latex, banana, kiwi, fig, chestnut, and avocado are the main causes of reactions.
Food-latex	11	Individuals allergic to banana, kiwi, fig, chestnut, and avocado may be at an increased risk of reactions to latex.



Evaluation: History & Physical Exam

- History: very important
  - Symptoms, timing, amount, raw vs. cooked food, reproducibility, treatment, and outcome
  - Concurrent exercise, medications, alcohol
- Diet details / symptom diary
- Physical exam: assess for other disorders
- Identify general mechanism

Allergy vs. intolerance; IgE vs. non-IgE mediated


Allergy profile - Test
FOODS CONTINUED
Pear
Pineapple
Poppy Seed
Pork Meat
Potato
Rice
Rye
Sesame Seed
Apple
Avocado
Banana
Barley
Cashew
Chestnut
English Walnut
Hazelnut
Peanut
Pecan
Pine Nut
Walnut

Food allergy: treatment

- Correct diagnosis
- Treatment of reactions
- Avoidance
- Role of dietician
- Tolerance assessment
- Prevention
- Immunotherapeutic strategies

Adapted from Adverse Reactions to Foods Committee. Spanish Society of Allergy and Clinical Immunology

GLORIA Global Resources In Allergy™

General Principles of Management

- Avoidance of the food allergen
- nutritional needs for children are met
- Education
- Written individualized healthcare plans (IHP) and emergency action plans (EAP)
- Quick access to emergency medications including self-injectable epinephrine (SIE)

- **Avoidance of the suspect food** is crucial.
- **Careful reading of food labels** is a priority.
- **Medical information jewelry** with appropriate information should be worn.

Food Allergies & Anaphylactic Shock

1. Common allergens

Allergy

An allergy is the body's unusual response to a normally harmless substance. Allergies can present in various ways and can range from mild to severe.

Anaphylactic Shock

Anaphylactic Shock is a severe allergic reaction at the extreme end of the allergic response range. The whole body is affected, usually within minutes of exposure to the allergen but sometimes it can take longer for the reaction to show. Anaphylactic Shock has the potential to be fatal as it can cause issues to the casualty's airway and breathing.

Common food allergen symbols to look out for

Contains public sector information published by the Food Standards Agency

2. Recognising an allergic reaction

Common symptoms that can occur during an allergic reaction:

- Sneezing / wheezing / coughing / shortness of breath
- Red itchy rash / blotchy skin, sometimes with raised areas
- Swelling, often in hands, feet or face (can be anywhere)
- Abdominal pain, nausea, vomiting and diarrhoea
- Widespread flushing of the skin
- Itchy eyes, ears, lips, throat and mouth
- Difficulty breathing
- Feeling of confusion and fear

A serious allergic reaction can cause a dramatic fall in blood pressure (anaphylactic shock). The casualty can become weak leading to collapse and the casualty becoming unresponsive.

3. Treatment of allergy

- Ask the casualty if they have any known allergies.
- Assess how serious the allergic reaction is by looking at their symptoms.
- If the casualty has medication for an allergy encourage them to take it.
- Call the Emergency Medical Services (EMS) by dialling 999/112.

4. Recognising Anaphylactic Shock

Common symptoms that occur during Anaphylactic Shock:

- A rash on the skin
- Swelling
- Anxiety, often a feeling of doom
- Life-threatening airway, breathing or circulation problems (sometimes a combination of these)
  - Airway - swelling of the throat, mouth or lips - feeling of throat closing
    - You may recognise this from loud breathing or a hoarse voice
  - Breathing / Wheezing / feeling of a tight chest
    - Appears similar to an asthma attack
  - Circulation / sudden feeling of weakness, dizziness or faint
    - May appear pale with clammy skin and a fast pulse. Often nausea, vomiting and stomach cramps

5. Treatment of Anaphylactic Shock

- Immediately call the EMS by dialling 999/112.
- Assist the casualty to administer adrenaline using their auto injector.
- Massage injection site area for 10 seconds after injection.
- Place casualty in a sitting position (making it easier for them to breath).
- Help the casualty to sit up in the position that best relieves any breathing difficulties. If casualty becomes pale with a weak pulse, help them to lie down with legs raised and treat for shock.
- Monitor and record vital signs while waiting for help to arrive.
- Give a second auto injector 5 minutes after the first if there is no improvement.

6. Unresponsive – Not Breathing

If the casualty becomes unresponsive commence CPR

01. Ensure the casualty is on a firm, flat surface.
02. Place the heel of one hand on top of the other in the centre of the casualty's chest. *(Fig. 1)*
03. Compress the chest (maximum depth of approximately 5-6cm) 30 times at a rate of 100-120 compressions per minute. The compressions and releases should take an equal amount of time.
04. After 30 compressions, open the airway again using head tilt/chin lift.
05. Seal the nostrils with your thumb and forefinger. *(Fig. 2)*
06. Blow steadily in to the mouth until you see the chest rise, 2 rescue breaths, blow in for 1 second, 2 breaths within 10 seconds. *(Fig. 2)*
07. Remove your mouth to the side and let chest fall. Inhale some fresh air, when breathing for the casualty.
08. Repeat so you have given 2 effective rescue breaths in total within 10 seconds.
09. If chest does not rise after the second breath, go back to 30 compressions then try again with 2 breaths.
10. Return your hands to the correct position on the chest and give a further 30 chest compressions.


Fig. 1


Fig. 2

Continue with CPR until

- The casualty shows signs of recovery.
- You become exhausted and unable to continue.
- Emergency Services arrive.
- The situation changes and you are now in immediate danger.

7. Defibrillation

Use an AED (Automated External Defibrillator) if available and follow prompts.

The information contained in the poster is for guidance only and should not be used as a substitute for recognised training.

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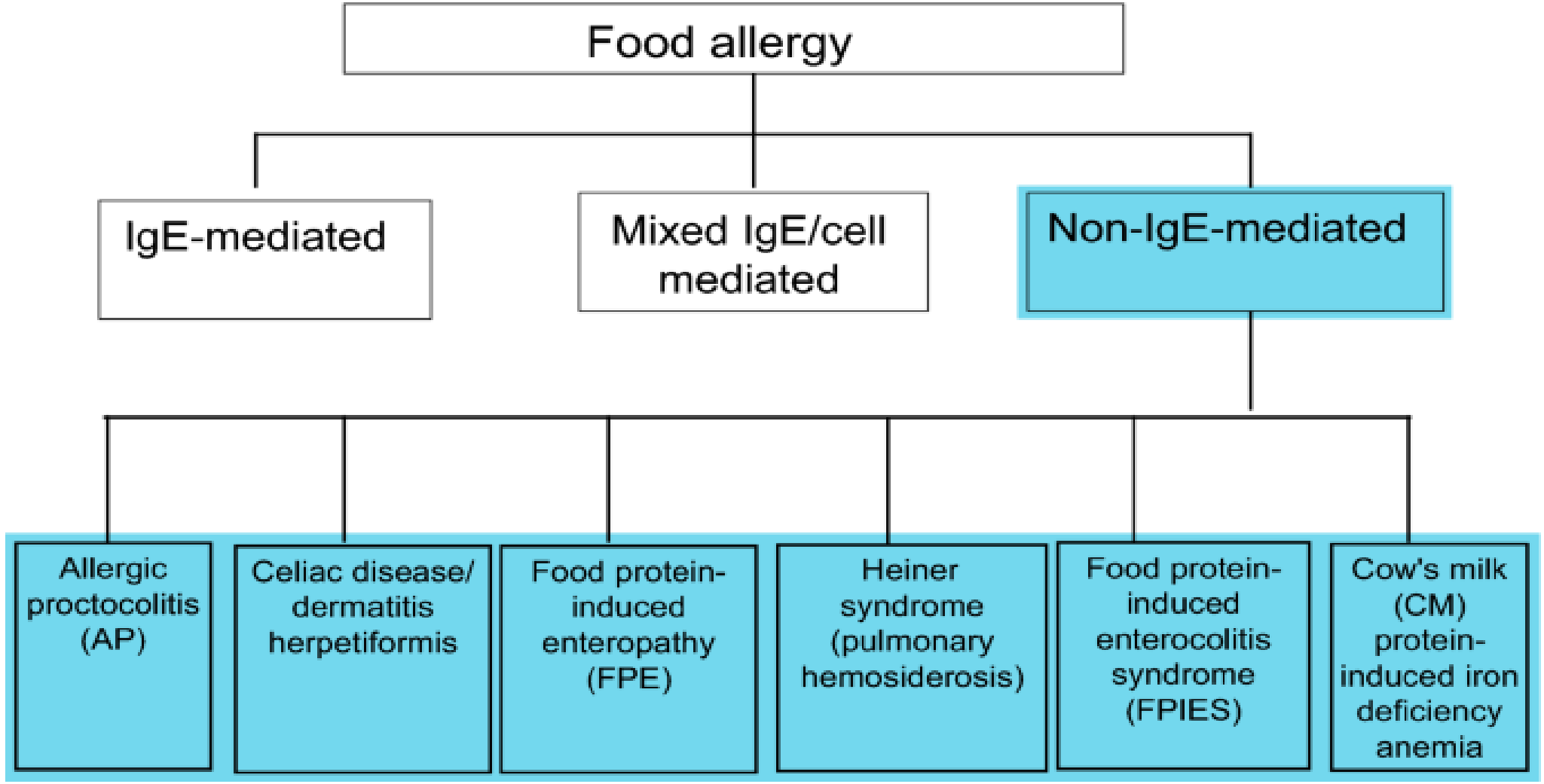

➢NON-IgE-MEDIATED REACTIONS

- more subacute and/or chronic symptoms
- typically isolated to the gastrointestinal tract and/or skin.

Food protein–induced enterocolitis syndrome (FPIES)

- in the 1st several mo of life
- irritability, intermittent vomiting, and protracted diarrhea and may result in dehydration
- Vomiting : 1-4 hr after feeding,
- continued exposure may result in abdominal distention, bloody diarrhea, anemia, and failure to thrive.

- Symptoms are most often provoked by **cow's milk or soy protein–based formulas**.

- A similar enterocolitis syndrome : in older infants and children from **rice, oat, wheat, egg, peanut, nut, chicken, turkey, or fish.**

- Hypotension occurs in approximately 15% of patients after allergen ingestion and may initially be thought to be caused by sepsis.

- FPIES usually resolves by age 3-5 yr.

Food protein–induced allergic proctocolitis (FPIAP)

- presents in the 1st few mo of life
- blood-streaked stools in otherwise healthy infants
- Approximately 60% of cases occur among breastfed infants,
- with the remainder largely among infants fed cow's milk or soy protein–based formula.
- Blood loss is typically modest but can occasionally produce anemia.

➢ Food protein–induced enteropathy (FPE)

- often manifests in the 1st several mo of life as diarrhea, often with steatorrhea and poor weight gain

- Symptoms : protracted diarrhea, vomiting in up to 65% of cases, failure to thrive, abdominal distention, early satiety and malabsorption.

- Anemia, edema, and hypoproteinemia occur occasionally.

- Cow's milk sensitivity is the most common cause of FPE in young infants,
- sensitivity to soy, egg, wheat, rice, chicken, and fish in older children.

- Celiac disease, the most severe form of FPE,

Table 176.5 Food Protein–Induced Gastrointestinal Syndromes

	FPIES	PROCTOCOLITIS	ENTEROPATHY	EOSINOPHILIC GASTROENTEROPATHIES*
Age at onset	1 day–1 year	1 day–6 months	Dependent of age of exposure to antigen, cow's milk and soy up to 2 yr	Infant to adolescent
Food proteins implicated				
Most common	Cow's milk, soy	Cow's milk, soy	Cow's milk, soy	Cow's milk, soy, egg white, wheat, peanut
Less common	Rice, chicken, turkey, fish, pea	Egg, corn, chocolate	Wheat, egg	Meats, corn, rice, fruits, vegetables, fish
Multiple food hypersensitivities	>50% both cow's milk and soy	40% both cow's milk and soy	Rare	Common
Feeding at the time of onset	Formula	>50% exclusive breastfeeding	Formula	Formula
Atopic background				
Family history of atopy	40–70%	25%	Unknown	~50% (often history of eosinophilic esophagitis)
Personal history of atopy	30%	22%	22%	~50%
Symptoms				
Emesis	Prominent	No	Intermittent	Intermittent
Diarrhea	Severe	No	Moderate	Moderate
Bloody stools	Severe	Moderate	Rare	Moderate
Edema	Acute, severe	No	Moderate	Moderate
Shock	15%	No	No	No
Failure to thrive	Moderate	No	Moderate	Moderate

Laboratory findings				
Anemia	Moderate	Mild	Moderate	Mild-moderate
Hypoalbuminemia	Acute	Rare	Moderate	Mild-severe
Methemoglobinemia	May be present	No	No	No
Allergy evaluation				
Food skin-prick test	Negative†	Negative	Negative	Positive in ~50%
Serum food allergen IgE	Negative†	Negative	Negative	Positive in ~50%
Total IgE	Normal	Negative	Normal	Normal to elevated
Peripheral blood eosinophilia	No	Occasional	No	Present in <50%
Biopsy findings				
Colitis	Prominent	Focal	No	May be present
Lymph nodular hyperplasia	No	Common	No	Yes
Eosinophils	Prominent	Prominent	Few	Prominent; also neutrophilic infiltrates, papillary elongation, and basal zone hyperplasia
Food challenge	Vomiting in 1-4 hr; diarrhea in 5-8 hr	Rectal bleeding in 6-72 hr	Vomiting, diarrhea, or both in 40-72 hr	Vomiting and diarrhea in hours to days
Treatment	Protein elimination, 80% respond to casein hydrolysate and symptoms clear in 3-10 days; rechallenge under supervision in 1.5-2 yr	Protein elimination, symptoms clear in 3 days with casein hydrolysate; resume/continue breastfeeding on maternal antigen-restricted diet; reintroduce at home after 9-12 mo of age	Protein elimination, symptoms clear in 1-3 wk; rechallenge and biopsy in 1-2 yr	Protein elimination, good response to casein hydrolysate, excellent response to elemental diet; symptoms clear in 2-3 wk, excellent acute response to steroids; rechallenge by introducing food at home and biopsy in 1-2 yr
Natural history	Cow's milk: 60% resolved by 2 yr Soy: 25% resolved by 2 yr	Resolved by 9-12 mo	Most cases resolve in 2-3 yr	Typically a prolonged, relapsing course
Reintroduction of the food	Supervised food challenge	At home, gradually advancing from 1 oz to full feedings over 2 wk	Home, gradually advancing	Home, gradually advancing

- The following facts should be established:

(1) the food suspected of provoking the reaction and the quantity ingested,

(2) The interval between ingestion and the development of symptoms,

(3) The types of symptoms elicited by the ingestion,

(4) ingesting the suspected food produced similar symptoms on other occasions,

(5) other inciting factors, such as exercise, are necessary,

(6) the interval from the last reaction to the food.

Evaluation:
Elimination Diets & Food Challenges

- Elimination diets (1-6 weeks) most useful for chronic disease (eg. AD, GI syndromes)

- Oral food challenge – MD supervised, emergency meds available
  - ✓ Open
  - ✓ Single-blind
  - ✓ Double-blind, placebo-controlled (DBPCFC)-gold standard

- May require ancillary testing (endoscopy/biopsy)

Dietary Elimination

- Complete avoidance (e.g. peanut) vs. partial avoidance (e.g. avoid whole egg but eat baked egg products if tolerant)

- Advisory warning labels (May contain…, Processed in a facility…). For peanut, <10% of products had peanut.[2]

Hypoallergenic Infant Formulas for Cow's Milk Allergy (CMA)

- Soy based formulas For IgE-CMA, soy co-allergy is 0- 14%[1].
- For non-IgE CMA, soy co-allergy 0%[2] to 60%[3].
- Partial hydrolysates (e.g. Good Start, Peptamin Jr, Pediasure Peptide) are not recommended for CMA
- Extensively hydrolyzed formulas (EHF) Alimentum, Nutramigen, Pregestimil: >90% tolerance in IgE-CMA
- Elemental amino acid based formulas (Neocate, Elecare, PurAmino): CMA,FPIES intolerant of EHF, EoE

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Food Allergy Prevention

- Recommendations for prevention of allergic diseases aimed at the high-risk newborn who has not manifested atopic disease include

- exclusive breast feeding for the first 4-6 months or

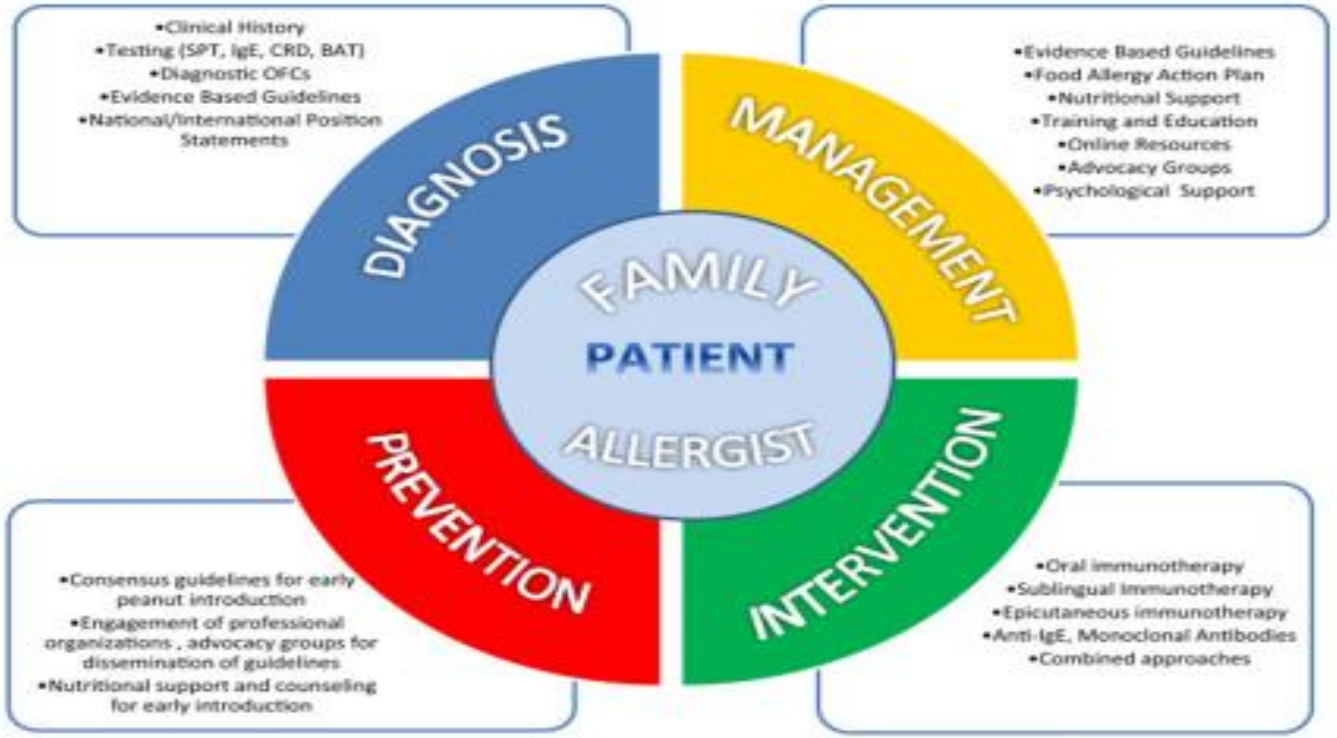
- using an extensively hydrolyzed formula for the first 4-6 months and introducing solid foods between 4 and 6 months of age.

- Other approaches, such as maternal avoidance diets during pregnancy and during lactation, as well as avoidance of allergenic foods for infants beyond 6 months of age, are unproven.

Future Therapies for Food Allergy

- In clinical trials:
- Oral immunotherapy (OIT) for milk, egg, peanut, multiple food combinations
- OIT in combination with anti-IgE
- Sublingual immunotherapy (SLIT)
- Epicutaneous (patch) immunotherapy for milk, peanut
- OIT with baked milk, egg for milk and egg allergy
- Chinese Herbal Formula (FAHF-2)
- Anti-IL5 for treatment of eosinophilic esophagitis

Take home message



Thank You..!

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