Food allergy

Hossein Esmaeilzadeh
Associate Prof. of Allergy and Clinical Immunology
Shiraz University of medical sciences, Shiraz, Iran

Diagnosis

What is allergy? Which of these cases are allergy?

1- Abdominal pain and diarrhea in 5 years old girl after milk but NL PMH?

2- pruritus of lips after eating eggplant but not always?

A. Case one

B. Case Two

C. Both

D. Non

TABLE 81-5 Classification of Food-Allergic Disorders Based on Pathophysiology

Disorder	IgE-Mediated Response	IgE- and Cell-Mediated Response	Non–IgE-Mediated Response
Generalized	Food-dependent, exercise-induced anaphylaxis		
Cutaneous	Urticaria, angioedema, flushing, acute morbilliform rash, acute contact urticaria	Atopic dermatitis, contact dermatitis	Contact dermatitis, dermatitis herpetiformis
Gastrointestinal	Oral allergy syndrome, gastrointestinal anaphylaxis	Allergic eosinophilic esophagitis, allergic eosinophilic gastroenteritis	Allergic proctocolitis, food protein-induced enterocolitis syndrome, celiac disease, infantile colic
Respiratory	Acute rhinoconjunctivitis, acute bronchospasm	Asthma	Pulmonary hemosiderosis (Heiner syndrome)

IgE AND NON–IgE-MEDIATED DISORDERS:

- Eosinophilic esophagitis:

Children: chronic or intermittent symptoms of gastroesophageal reflux, emesis, dysphagia, abdominal pain, and irritability

Adults: abdominal pain, dysphagia, and food impaction

improvement with elimination diet within 6-8 wk; elemental diet may be required; often responds to swallowed topical steroids

- **Allergic eosinophilic gastroenteritis**

Chronic or intermittent abdominal pain, emesis, irritability, poor appetite, failure to thrive, weight loss, anemia, protein losing gastro enteropathy

improvement with elimination diet within 6-8 wk; elemental diet may be required

NON–IgE-MEDIATED DISORDERS

- **Allergic proctocolitis**

Blood-streaked or heme-positive stools; otherwise healthy appearing

History, prompt response (resolution of gross blood in 48 h) to allergen elimination; biopsy conclusive but not necessary for most

- Food protein-induced enterocolitis syndrome

Chronic: emesis, diarrhea, failure to thrive on chronic exposure
Subacute: repetitive emesis, dehydration (15% shock), diarrhea on repeat exposure after elimination period; breastfeeding protective

Most of non IgE diseases resolve in 1-3 Y

Approach

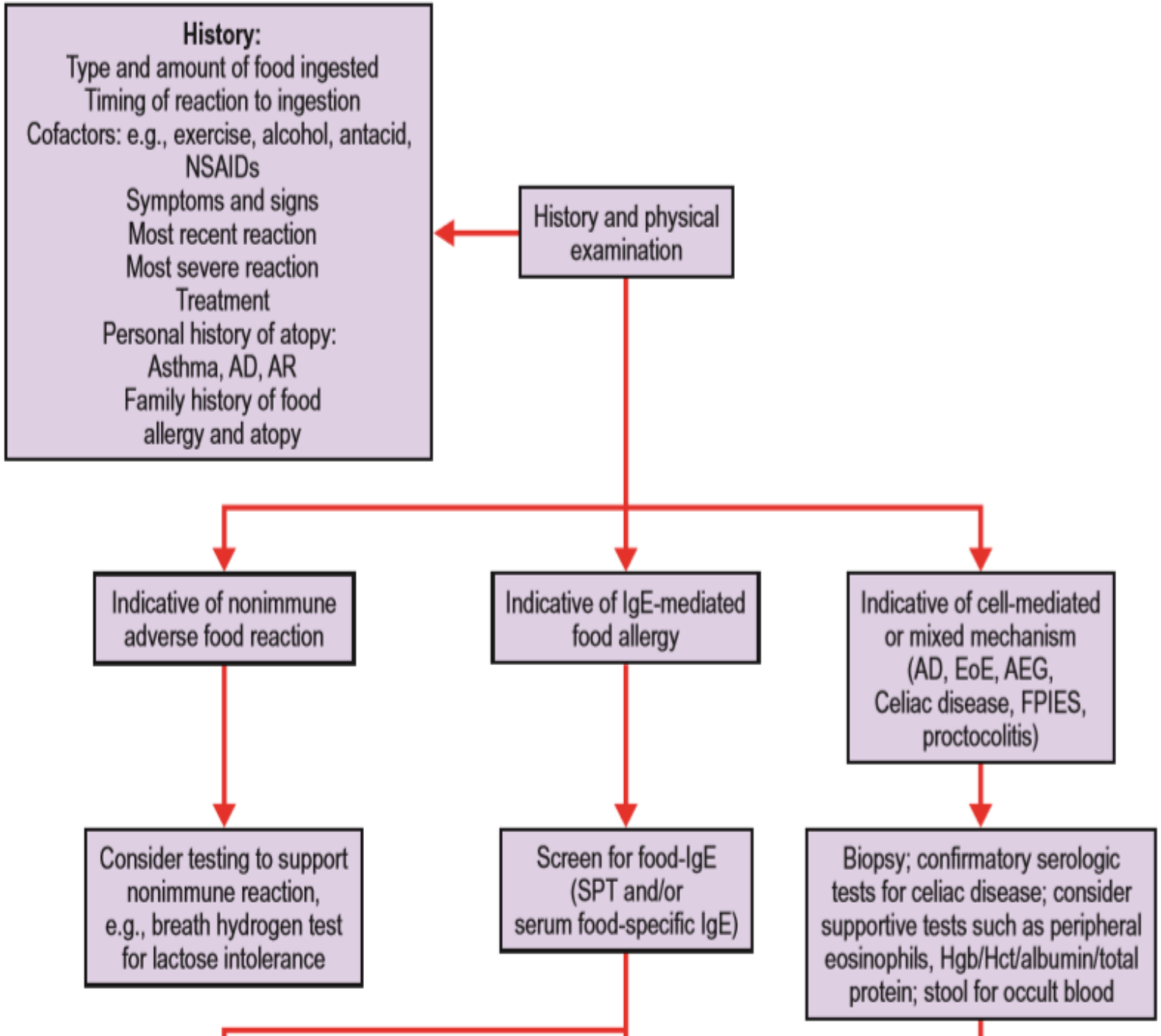
Which is best diagnostic approach for food allergy?

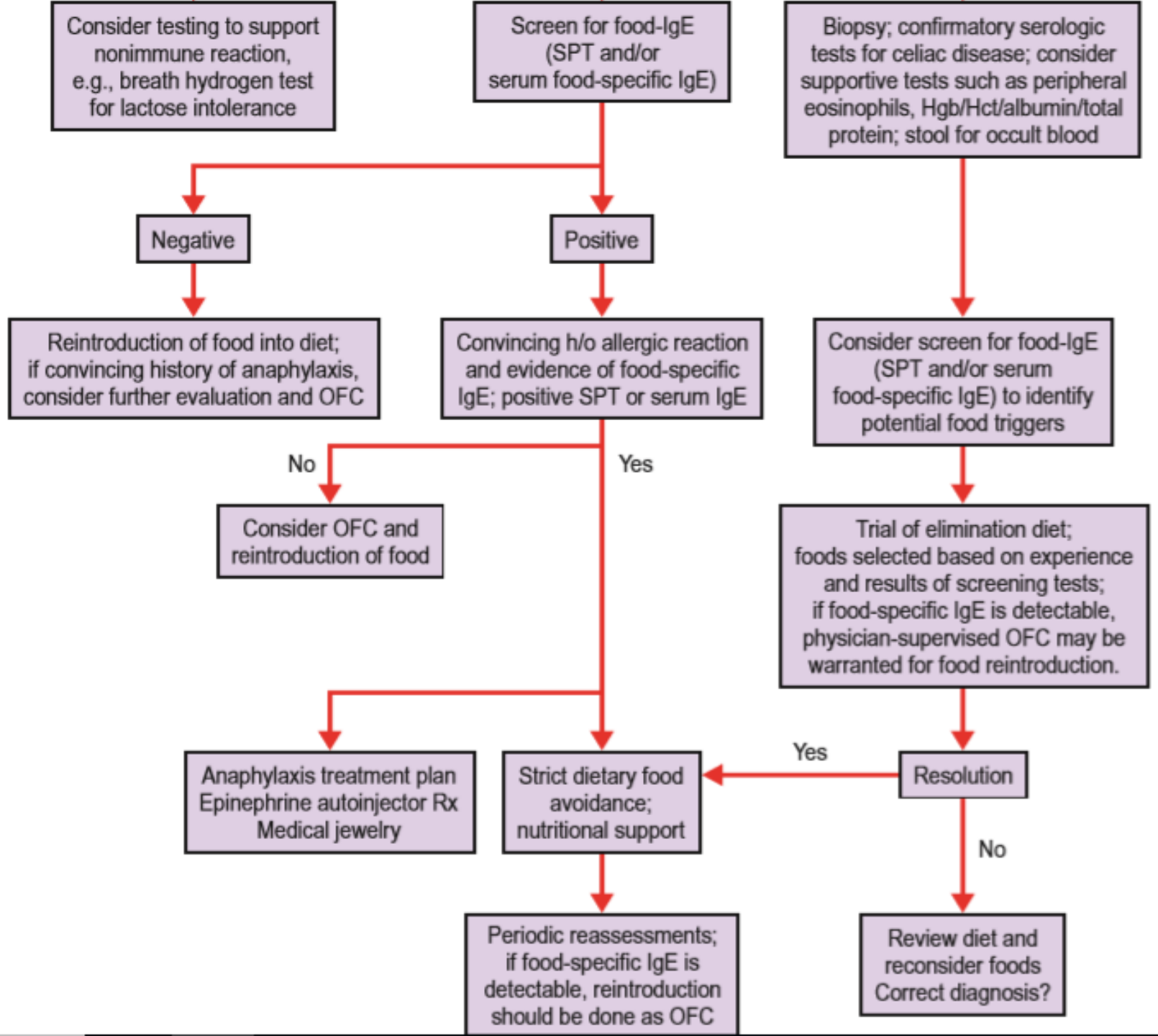
A. Skin Prick test
B. Response to Avoidance
C. Oral Food Challenge
D. RIDA Blood test

Main diagnosis is based on History

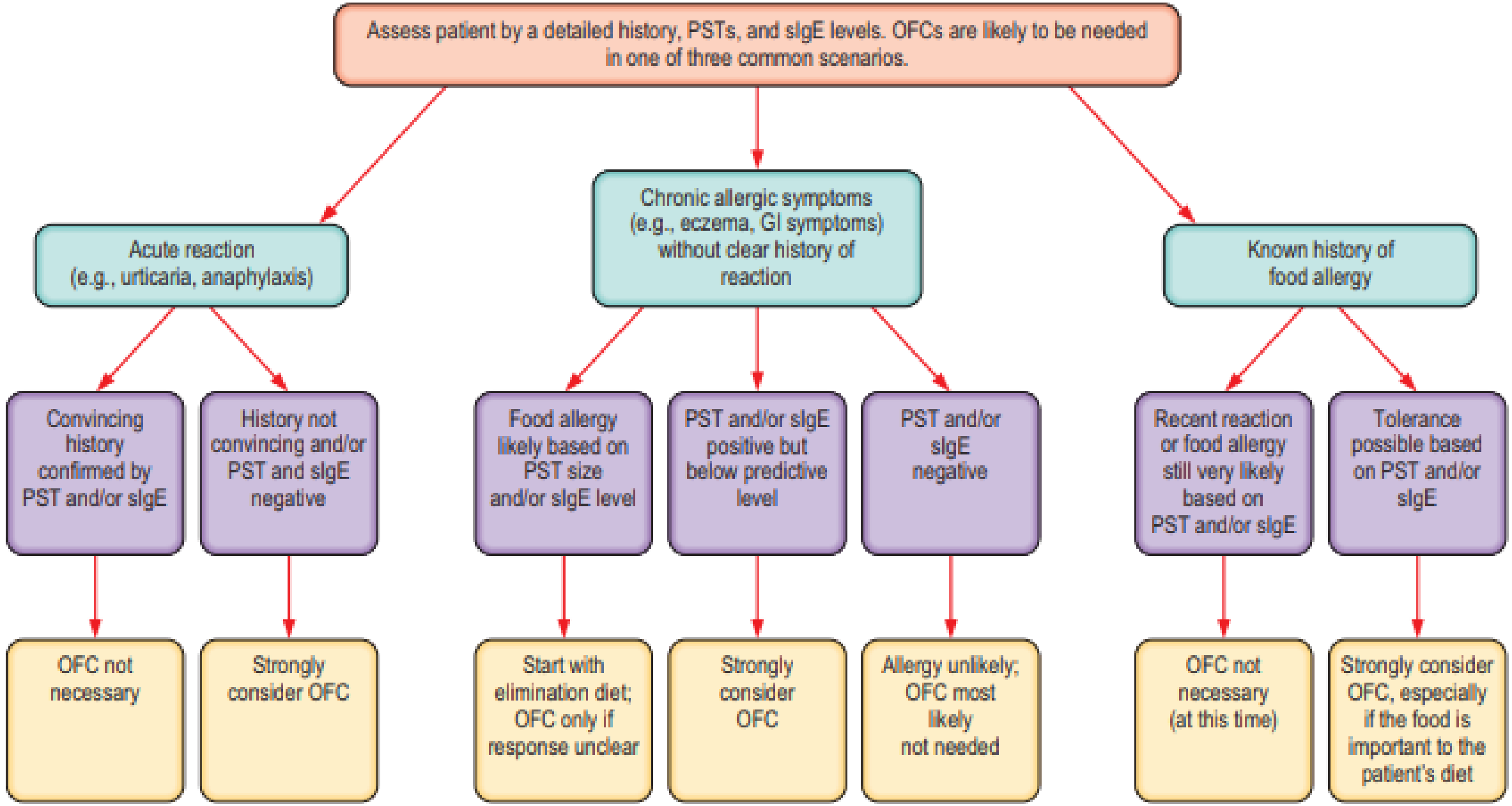
Skin Prick Test (SPT) is most sensitive and specific test in IgE mediated and mixed reactions

Blood test are less sensitive
RIDA is not useful at all
Immunoicap is best in blood tests


History:
Type and amount of food ingested
Timing of reaction to ingestion
Cofactors: e.g., exercise, alcohol, antacid, NSAIDs
Symptoms and signs
Most recent reaction
Most severe reaction
Treatment
Personal history of atopy:
Asthma, AD, AR
Family history of food allergy and atopy
History and physical examination
Indicative of nonimmune adverse food reaction
Indicative of IgE-mediated food allergy
Indicative of cell-mediated or mixed mechanism (AD, EoE, AEG, Celiac disease, FPIES, proctocolitis)
Consider testing to support nonimmune reaction, e.g., breath hydrogen test for lactose intolerance
Screen for food-IgE (SPT and/or serum food-specific IgE)
Biopsy; confirmatory serologic tests for celiac disease; consider supportive tests such as peripheral eosinophils, Hgb/Hct/albumin/total protein; stool for occult blood


Consider testing to support nonimmune reaction, e.g., breath hydrogen test for lactose intolerance
Screen for food-IgE (SPT and/or serum food-specific IgE)
Biopsy; confirmatory serologic tests for celiac disease; consider supportive tests such as peripheral eosinophils, Hgb/Hct/albumin/total protein; stool for occult blood
Negative
Positive
Reintroduction of food into diet; if convincing history of anaphylaxis, consider further evaluation and OFC
Convincing h/o allergic reaction and evidence of food-specific IgE; positive SPT or serum IgE
Consider screen for food-IgE (SPT and/or serum food-specific IgE) to identify potential food triggers
No
Yes
Consider OFC and reintroduction of food
Trial of elimination diet; foods selected based on experience and results of screening tests; if food-specific IgE is detectable, physician-supervised OFC may be warranted for food reintroduction.
Anaphylaxis treatment plan Epinephrine autoinjector Rx Medical jewelry
Strict dietary food avoidance; nutritional support
Yes
Resolution
No
Periodic reassessments; if food-specific IgE is detectable, reintroduction should be done as OFC
Review diet and reconsider foods Correct diagnosis?

A medically supervised oral food challenge (OFC) is considered the most specific test for food allergy.



PST; skin prick test, sIgE; specific IgE

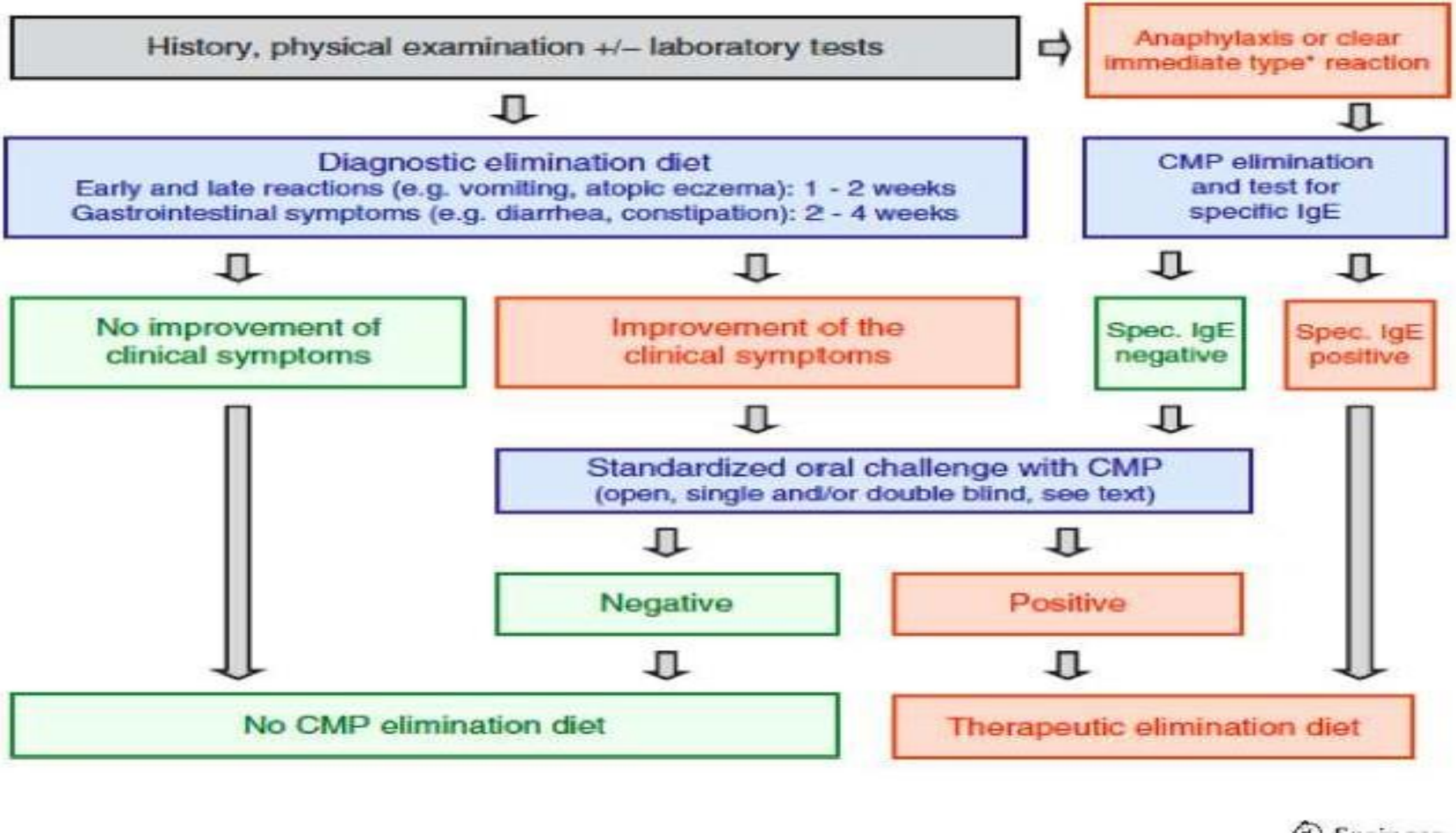

History, physical examination +/– laboratory tests
Anaphylaxis or clear immediate type* reaction
Diagnostic elimination diet
Early and late reactions (e.g. vomiting, atopic eczema): 1 - 2 weeks
Gastrointestinal symptoms (e.g. diarrhea, constipation): 2 - 4 weeks
CMP elimination and test for specific IgE
No improvement of clinical symptoms
Improvement of the clinical symptoms
Spec. IgE negative
Spec. IgE positive
Standardized oral challenge with CMP
(open, single and/or double blind, see text)
Negative
Positive
No CMP elimination diet
Therapeutic elimination diet

TABLE II. Tests to assess the likelihood of obtaining a positive or negative OFC in children

Food	Serum food-IgE (kIU/L)*		SPT wheal (mm)*	
	~95% Positive	~50% Negative†	~95% Positive	~50% Negative†
Cow's milk	≥15[16]	≤2[23]	≥8[21]	
	≥5 if younger than 1 year[132]			
Egg white	≥7[16]	≤2[23]	≥7[21]	≤3[22]
	≥2 if younger than 2 years[133]			
Peanut	≥14[16]	≤2 with and ≤5 without history of peanut reaction[24]	≥8[17,21]	≤3[17]
Fish	≥20[16]			

children with about 50% chance of experiencing a negative challenge are the optimal candidates for an office-based OFC. However, serum levels of
food-specific IgE antibodies and SPT wheal sizes are not absolute indications or contraindications to performing an OFC

laboratory test results are never an absolute indication or contraindication to performing an OFC

And that laboratory test results need to be interpreted in the context of a clinical history of an individual patient

An OFC is preceded by a period of dietary elimination, performed either therapeutically or for diagnostic reasons specially when

food hypersensitivity is under consideration as a cause for a chronic disease such as atopic dermatitis or eosinophilic gastroenteropathy that symptoms , resolve after the suspected food(s) is removed from the diet

OFC is diagnostic in IgE mediated and mixed disorders and is mentioned as response to elimination diet in non IgE mediated disorders like proctocolitis

Where and how do the OFC?

Cumulative dosing§:			
Time (min)	% of total food	Amount of challenge food, g	Amount of wheat flour, g
00	0.1%	0.1	0.01
05	0.5%	0.5	0.05
20	1%	1	0.1
35	4%	4	0.4
50	10%	10	1
60	20%	20	2
70	20%	20	2
80	20%	20	2
90	24.4%	24.4	2.44
Total	100%	100 g	10 g

2016 consensus

a general challenge schedule consisting of 3, 10, 30, 100, 300, 1000, and 3000 mg of food protein at intervals of at least 20 minutes

TABLE I. Equivalent amount of food in milligrams (and milliliter) for the major foods in various forms often used in challenges

Food protein	Pasteurized cow's milk with 3.3% protein content	Skim milk powder with 36% protein content	Pasteurized whisked hen's egg with 12.8% protein content	Hen's egg powder with 47% protein content
3 mg	91 mg ≈ 0.1 mL	8.3 mg	23.4 mg	6.4 mg
10 mg	303 mg ≈ 0.3 mL	27.8 mg	78.1 mg	21.3 mg
30 mg	909 mg ≈ 0.9 mL	83.3 mg	234.4 mg	63.8 mg
100 mg	3,030 mg ≈ 3.0 mL	277.8 mg	781.3 mg	212.8 mg
300 mg	9,091 mg ≈ 9.1 mL	833.3 mg	2,343.8 mg	638.3 mg
1000 mg	30,303 mg ≈ 30.3 mL	2,777.8 mg	7,812.5 mg	2,127.7 mg
3000 mg	90,909 mg ≈ 90.9 mL	8,333.3 mg	23,437.5 mg	6,383 mg

Protein Fraction and Nomenclature	Percent of Total Food Protein*	Molecular Mass (kD)
CLASS I FOOD ALLERGENS		
ANIMAL		
Cow's milk		
Caseins	76-86	19-24
α_{s1}-Casein, Bos d 8	53-70	27
α_{s}-Casein	45-50	23
β-Casein	25-35	24
κ-Casein	8-15	19
Whey	14-24	
β-Lactoglobulin, Bos d 5	7-12	36
α-Lactalbumin, Bos d 4	2-5	14
Serum albumin, Bos d 6	0.7-1.3	69

cross reactivity among milk proteins in cows, goats, and sheep due to their high degree of homology.

Oral challenge studies indicated that at least 90% of cow's milk–allergic children react to goat's milk

About 10% of milk allergic children react to beef, with a slightly higher percentage reacting to rare beef.

Extensive heating (e.g., boiling at 95° C for about 20 minutes) destroys several of the whey proteins. However, routine pasteurization is not sufficient to denature these proteins, but it may increase the allergenicity of some milk proteins, such as β-lactoglobulin

Until now, camel and donkey milk seems to be the most appropriate substitute for cow milk

Text Message
Thu, May 24, 7:01 AM

درود
مرکزتولیدوفروش شیر دارویی اکسیر
ارسال به سراسر ایران
تولیدوعرضه شیرهای درمانی اسب و
الاغ و شتر دوشیدن به صورت
حضوری (درمان بسیاری از بیماری
های کودکان و بزرگسالان)
سپهری 09101512041
آدرس و:خیابان نعیم آباد روبه روی
بانک صادرات
آدرس اسطبل:بلوار استقلال خیابان
محمودی
مسیریاب: http://yon.ir/ah4pn
تلگرام: t.me/shiredarooeexir
وبسایت: www.shireolaghs.ir
ربات: t.my/inoti_bot

THANK YOU
FOR YOUR
ATTENTION