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# Navigating Food Protein-Induced Enterocolitis Syndrome (FPIES)

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## Learning objective

- Recognize manifestations of chronic and acute FPIES and identify the most common food triggers
- Describe diagnostic approaches and the nutritional management of FPIES
- Apply information and review a case study on a real-world FPIES patient

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# Food Protein-Induced Enterocolitis Syndrome

Diagnosis is based on clinical presentation

There are no biomarkers to confirm diagnosis

Health Care Professional's Guide to the Nutritional Management of Food Allergies



SCAN ME

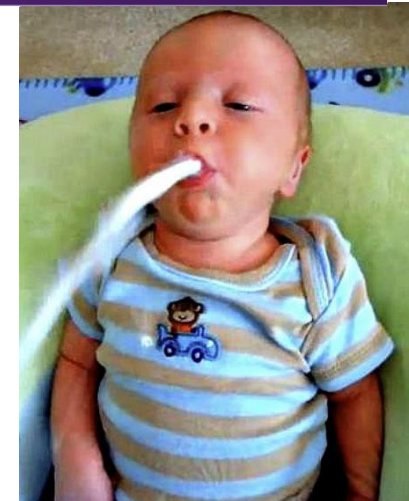


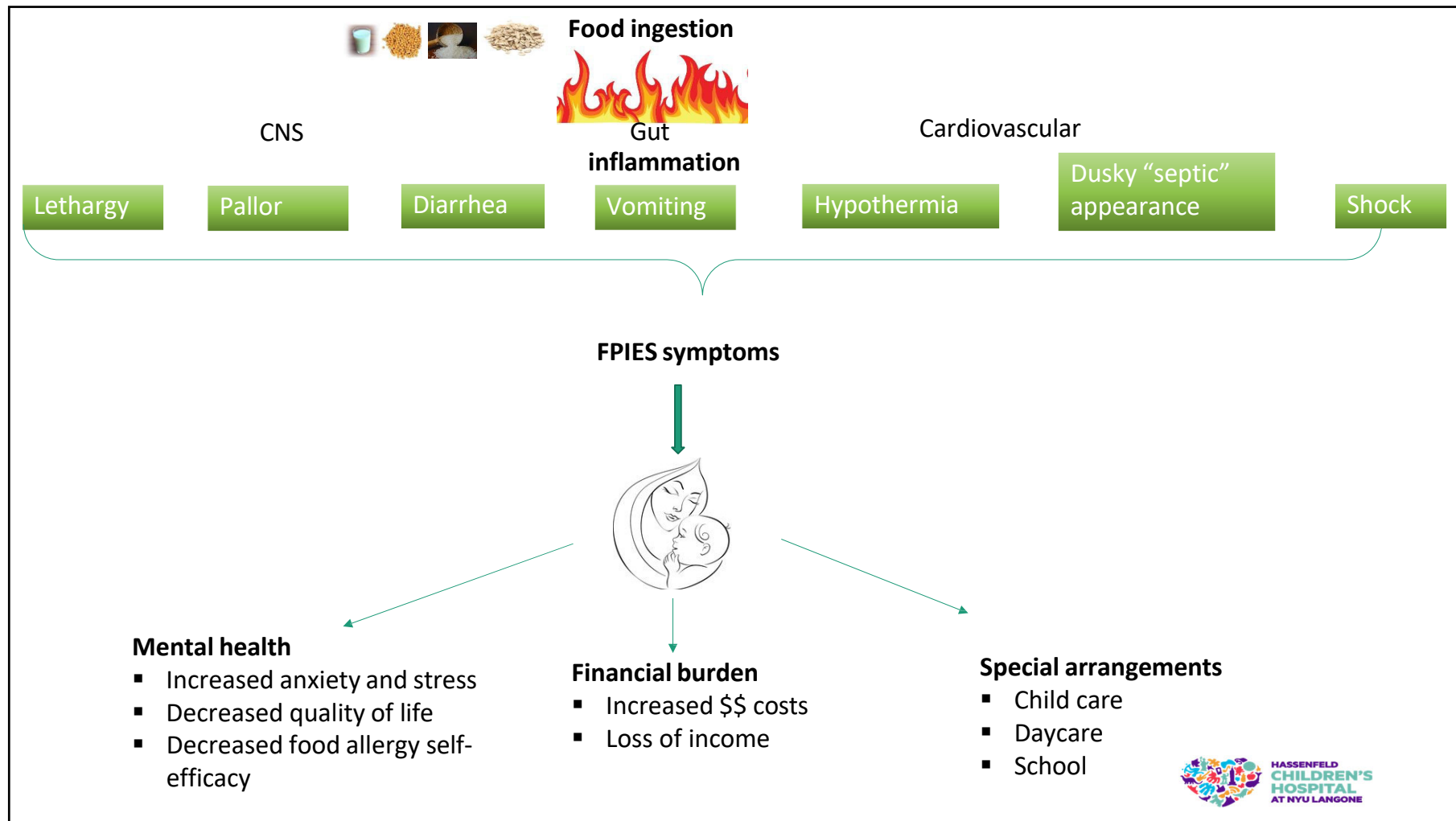
## FPIES: non IgE-mediated food allergy

Delayed (1-4 hrs) projectile, repetitive emesis, lethargy, pallor, low muscle tone

### FPIES reactions can be severe:

- dehydration
- hypovolemic/distributive shock (15-20%)
- leukocytosis with left shift
- metabolic derangements: acidosis, methemoglobinemia, low albumin/t. protein
- anemia
- elevated CRP





## FPIES is not rare

	Katz et al 2011	Mehr et al 2017	Bellon-Alonso et al 2018	Nowak-Wegrzyn et al 2019
Country	Israel	Australia	Spain	USA
Design	Unselected birth cohort	Population based (APSU)	Unselected birth cohort	Population-based
Diagnosis confirmation	OFC	Case-definition of acute FPIES	OFC	Self report
Foods	Cow's milk	Rice, CM, egg	CM, fish, egg yolk	n/a
Incidence	<b>0.34%</b> in the first 12 months	<b>0.015%</b> in the first 24 months	<b>0.7%</b> in the first 12 months	<b>0.51%</b> in less than 18 years; <b>0.22%</b> in $\geq 18$ years

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## FPIES: clinical diagnosis

Limited insights into pathophysiology

No biomarkers to confirm diagnosis

FPIES recognized as a constellation of symptoms

Delayed diagnosis

Pier J, et al. Front Allergy 2023

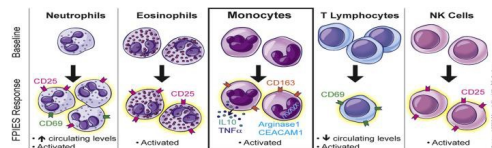
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## FPIES pathophysiology

- No evidence of humoral immune responses (Caubet JC et al, JACI, 2017)
- **CyTOF:** Broad systemic innate activation with pan-lymphocyte activation 4 hrs after symptom onset [Goswami et al, JACI 2017](#)
- **Proteomics:** 3 of the top 4 biomarkers were in TH17 pathway: IL-17A, IL-17C, CCL20; their source were T cells [Lozano-Ojalvo D, et al, JACI, 2021](#)
- Innate cytokines produced by monocytes were also increased: IL-6, IL-10, oncostatin M (OSM), leukemia inhibitory factor (LIF) and TNF $\alpha$ , REG1a
- **Metabolomics:** elevated inosine [Lozano-Ojalvo D, et al, JACI, 2022](#)
- Inosine was significantly and positively correlated with REG1a ( $R_s=0.49$ ,  $p=0.0004$ ), a regulator of mucosal barrier function that we previously reported to be upregulated after OFC.

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Nowak-Wegrzyn et al, JACI, 2017





# FPIES: constellation of symptoms

## Awareness of a clinical phenotype

- symptoms pattern in different ages
- food triggers

### Age of onset

- infants
- older age (children, adults)

### Frequency of feeding and food dose

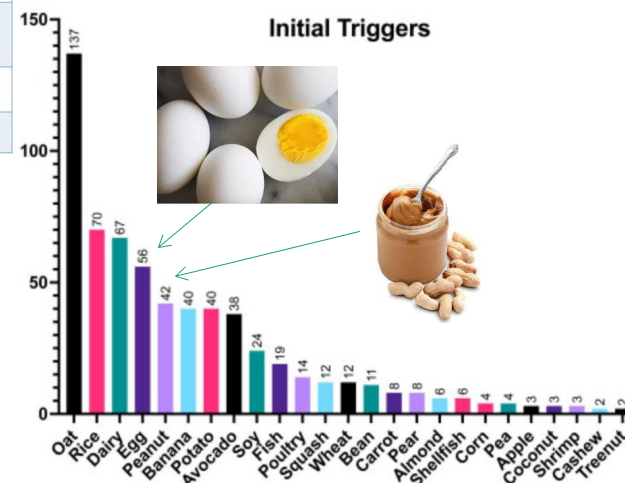
- acute (90%)
- chronic (10%)

### Food-sIgE

- undetectable-classic FPIES
- detectable-atypical FPIES (may be more protracted)

Food Trigger	Observed occurrence in cohorts	Co-allergy (reported occurrence)
Cow's milk	Australia: 33% Italy: 65% Spain: 50% US: 44-67%	Soy (~30-40%) Other solid foods (20%)
Soy	Australia: 5% Spain: 10% US: 14-50%	Cow's milk (~30-40%) Other solid foods (14%)
Egg	Australia: 12% Italy: 6% Spain: 12% US: 5%	None
Grains (rice, oats, barley, corn) <sup>2</sup>	Rice - US: 16-39% - Australia: 45% - Italy: 4-10%	Other grains (~40-50%) Rice react with oat (~33%)
Seafood	Fish - Australia: 5% - Italy: 12% - Spain: 34-54% - US: <1%	Other fish (35%)
Fruits/Vegetables (sweet potato, potato, banana, avocado)	Australia: 18% US: 15-19%	None
Meats (chicken, turkey, pork, beef)	Australia: 10% US: 4.5%	Poultry react with other poultry (~40%)

**Evolution of Food Protein-Induced Enterocolitis Syndrome (FPIES) Index Trigger Foods and Subsequent Reactions After Trial Diagnosis**  
Hua et al. JACI 2023



## Chronic FPIES

- Ongoing allergen ingestion, e.g., formula in infants over days-weeks
- Progressively worsening symptoms: watery diarrhea, emesis, weight loss, dehydration
- Following elimination of the food allergen symptoms resolve over days-weeks, in contrast to acute FPIES-resolves in 24 hours

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Nowak-Wegrzyn et al, JACI, 2017



Infants with FPIES may develop IgE to FPIES food trigger (atypical FPIES) as well as IgE-mediated allergy to other foods (comorbidity), consider testing for IgE in those with IgE-mediated FA, eczema and / or strong family h/o atopic disorders



Cow milk-FPIES  
1 in 4 develop  
+CM-IgE (atypical FPIES)



1 in 3 progress  
to immediate IgE- CMA

Overall 1 in 3 have IgE-FA to  
another food



Caubet JC, et al. JACI, 2014

Image by: James Heilman, MD.  
<https://creativecommons.org/licenses/by-sa/3.0/deed.en>



## FPIES phenotypes: adult onset

- **Seafood: crustaceans, fish, mollusks**
- **Dairy, wheat, egg**
- SYMPTOMS: dramatic, severe abdominal pain, nausea, vomiting, LOC; onset up to 6 hrs
- Median age at onset 25 years (IQR 20.5-38)
- All tolerated the trigger foods before
- 22/25 (88%) female
- **Median 8 reactions (IQR 5.5-10)**
- **Natural hx: unknown, may be persistent**

Fernandes BN, Boyle RJ, Gore C, Simpson A, Custovic A. J Allergy Clin Immunol. 2012; Gleich GJ, Sebastian K, Firszt R, Wagner LA. J Allergy Clin Immunol Pract. 2015 Nov; Du Y, Nowak-Wegrzyn A, Vadas P. Annals of Allergy Asthma and Immunology 2018; Tan JA, Smith WB JACI in Practice 2014; Gonzales-Delgado P, et al JACI in Practice 2018

## Acute FPIES diagnostic criteria

**1** Major criterion + **>3** Minor criteria

Vomiting in 1-4 hrs  
& absence of skin  
and respiratory sxs

>1 episode to the same food

Repetitive emesis to another food

Lethargy

Pallor

Emergency room visit

Need for intravenous fluids

Diarrhea in 24 hours (5-10 hours)

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Nowak<sup>1-3</sup>Węgrzyn A ,et al. FPIES Guidelines JACI 2017

## Diagnostic criteria for patients with possible chronic FPIES

The most important criterion for chronic FPIES diagnosis is resolution of the symptoms within days following elimination of the offending food(s) and acute recurrence of symptoms when the food is reintroduced, onset of vomiting in 1-4 hours, diarrhea in 24 hours (usually 5-10 hours).

Without confirmatory challenge, the diagnosis of chronic FPIES remains presumptive.

Nowak-Węgrzyn A ,et al. FPIES Guidelines JACI 2017





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FPIES OFC

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## FPIES OFC protocol

- No universally accepted standardized OFC protocol
- Under physician supervision, inpatient or outpatient
- Potentially high risk procedure, requires immediate availability of fluid resuscitation
- 50% of positive challenges require treatment; consider peripheral iv acces
- Gradual (over 30 min, 3 equal doses) or a single dose administration of food protein 0.06\*- 0.6 g / kg body weight, not to exceed total 3 g food protein
- If no reaction, discharge after 4-6 hours; post-reaction-6 hours and tolerating p.o. well

Nowak-Węgrzyn A ,et al. FPIES Guidelines JACI 2017





# Interpretation of FPIES OFC

<b>Major criterion</b>	<b>Minor Criteria: at least 2 present</b>
<p>Vomiting within 1- to 4-hours following consumption of the suspect food  <b>and</b>            the absence of classic IgE-mediated allergic skin or respiratory symptoms</p>	<ol style="list-style-type: none"> <li>1. Lethargy</li> <li>2. Pallor</li> <li>3. Diarrhea 5-10 h after food ingestion</li> <li>4. Hypotension</li> <li>5. Hypothermia</li> <li>6. Increased neutrophil count <math>\geq 1500</math> above the baseline count</li> </ol>



## Interpretation of FPIES OFC: caveats

A challenge might be interpreted as positive even if only the major criterion was met, under special circumstances:

1. In adults, severe abdominal pain may appear later, up to 6 hours after food consumption and emesis may be absent
2. Early administration of ondansetron might prevent repetitive emesis, pallor and lethargy
3. Evaluation of absolute neutrophil count may not be possible in some settings

**Additionally, in young patients with atypical FPIES, transient, mild skin rashes may be observed early after food ingestion and be followed by typical delayed, repetitive emesis.**



# Management of FPIES emergencies

SUMMARY STATEMENT 17: **Treat acute-FPIES as a medical emergency**, and be prepared to provide aggressive fluid resuscitation as approximately 15% of patients may develop hypovolemic shock. [Strength of Recommendation: Strong; Evidence Strength: IIa; Grade: B]

- **Acute**: manage FPIES emergencies (rehydration, ondansetron, methylprednisolone), no role for EAI (unless atypical and concern for ana), oral antihistamines
- **Spectrum of severity**: not every reaction needs ED evaluation and management

[Ondansetron in acute food protein-induced enterocolitis syndrome, a retrospective case-control study.](#)

Miceli Sopo S, Bersani G, Monaco S, Cerchiara G, Lee E, Campbell D, Mehr S.

Allergy. 2017 Apr;72(4):545-551. doi: 10.1111/all.13033. Epub 2016 Sep 6.

PMID: 27548842

## Long-term Nutritional Management in Infants and Toddlers: Breast-fed

- FPIES to food proteins in maternal milk is rare; infants usually react to direct feeding of a food
- Restricting maternal diet for the baby's FPIES triggers is usually not indicated
- Modification of maternal diet may be necessary for growth concerns / FTT, chronic or acute symptoms
- Introduce solids at 4-6 months, do not delay

Nowak-Węgrzyn A ,et al. FPIES Guidelines JACI 2017



## Long-term Nutritional Management in Infants and Toddlers: Formula-fed

- Cow's milk-one of the most common FPIES triggers
- Infant with CM-FPIES: eHF-rice HF-AAF-soy?
- Infant with CM or egg: FPIES-consider OFC to baked milk/egg
- Introduce solids at 4-6 months, do not delay

Nowak-Węgrzyn A ,et al. FPIES Guidelines JACI 2017



## Summary of the DRACMA recommendations- non-IgE-CMPA

World Allergy Organization (WAO) Diagnosis and Rationale for Action against Cow's Milk Allergy (DRACMA) guideline update – XI – Milk supplement/replacement formulas for infants and toddlers with CMA – Systematic review

### Recommendation 2:

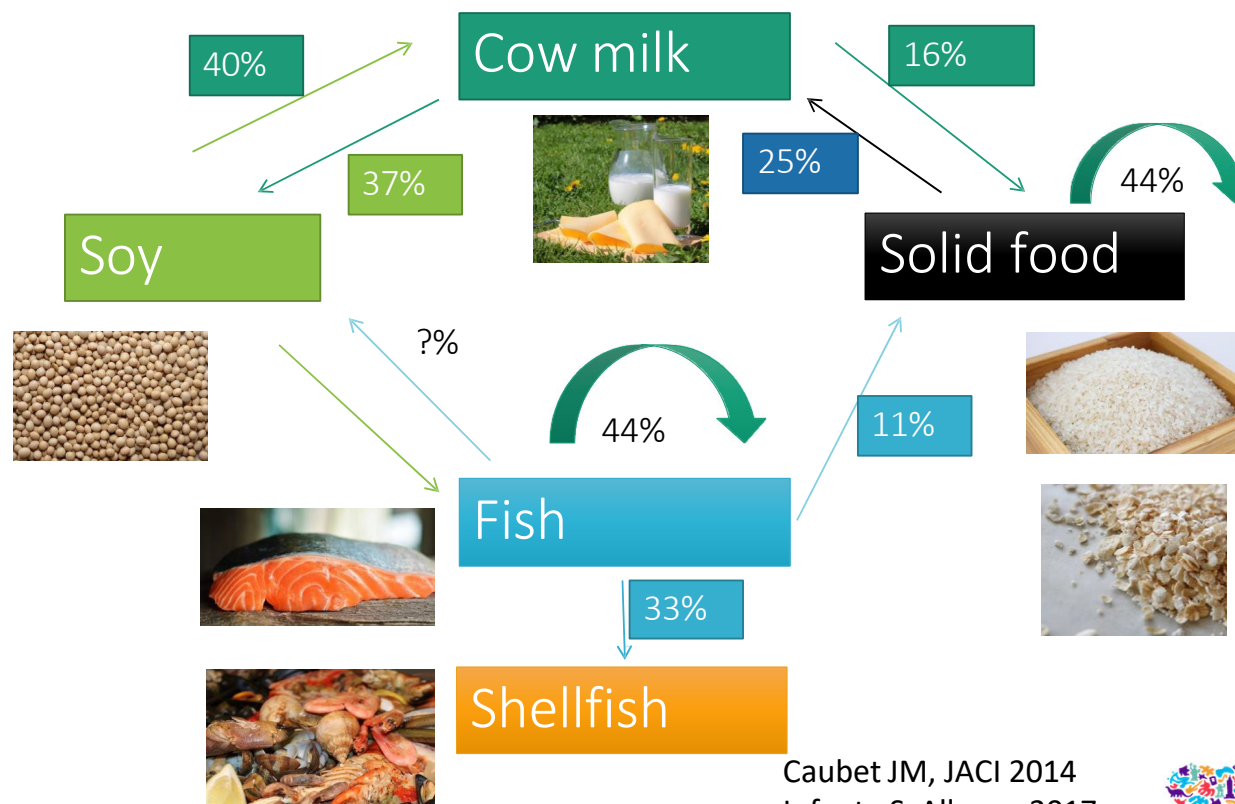
**When choosing a formula in infants with non-IgE-mediated CMA who are not being breastfed, we suggest an extensively hydrolyzed (cow's milk) formula or hydrolyzed rice formula as the first option, amino-acid formula as the second option, and soy formula as the third option. (Conditional recommendation based on very low certainty evidence about health effects)**

### Remarks:

1) In settings where soy formula is a viable option, sensitization to soy should be considered in the decision-making process for managing patients known not to respond to an avoidance diet with eHF-CM (i.e., children with FPIES or FPIAP).



# Risk of co-reactivity in FPIES



Caubet JM, JACI 2014  
 Infante S, Allergy, 2017



## Empirical approach to introduction of new foods at home

Serve 1 new food over 5-10 days. Start with 1/4 tsp and double amount with each serving. Serve twice per day (separated by 6 hours). Stop feeding if any symptoms.

Example: DAY ONE: ¼ tsp at 9am and ½ tsp at 5pm

DAY TWO: 1 tsp at 9am and 2 tsp at 5pm

Continue increasing until reaching an infant serving size

Infant serving size: 1-3 Tablespoons meat, 2 ounces fruit or vegetable, ¼ - ½ cup grains

Multiple servings (1-3) may be needed per day depending on age and nutritional needs

Food Group	Lower Risk	Higher Risk (unless already tolerated)
Milk and alternatives	Breast milk Hypoallergenic formula Fortified coconut, flax, hemp milk (for cooking only)	Milk, Soy, Pea, Oat, and Rice beverages
Meat, Seafood, Poultry	Lamb, Beef, Pork	Chicken Fish (adults), Shellfish (adults)
Grains	Quinoa, Millet, Amaranth	Rice, Oats
Vegetables	Broccoli, Cauliflower, Parsnip, Turnip, Pumpkin	Pea, Sweet Potato
Fruit	Blueberries, Plum, Peach, Strawberries, Watermelon	Avocado, Banana

Groetch M, et al. Dietary management of food protein-induced enterocolitis syndrome during the coronavirus disease 2019 pandemic. *Ann Allergy Asthma Immunol.* 2021; 126; 124-126.







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Baked milk/egg in FPIES?

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# Timing of food reintroduction (OFC or home) in FPIES

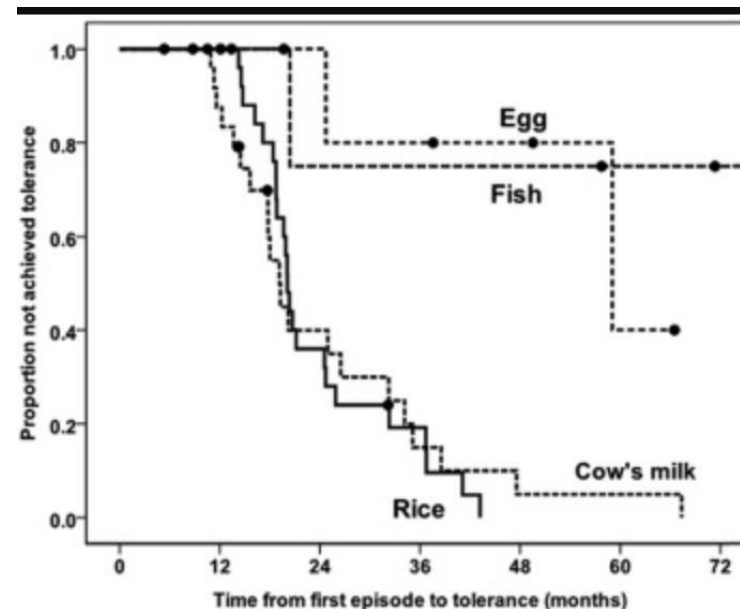
“We suggest that children with rice or cow's milk FPIES should have an OFC by at least 2 years of age, whereas challenges to egg and fish could be delayed until 5 years of age.”

> [J Allergy Clin Immunol Pract. 2017 Mar-Apr;5\(2\):486-488.e1. doi: 10.1016/j.jaip.2016.09.032. Epub 2016 Nov 9.](#)

## Resolution of acute food protein-induced enterocolitis syndrome in children

Eric Lee <sup>1</sup>, Dianne E Campbell <sup>2</sup>, Elizabeth H Barnes <sup>3</sup>, Sam S Mehr <sup>4</sup>

Affiliations + expand





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## Case-**13** month old male avoiding cow's milk / all dairy products due to acute infantile FPIES

Theo was fed breast milk and supplemented with Milk based term formula (CMF) x 2-4 weeks. He had no symptoms and was growing well. After that time, CMF was discontinued and he was exclusively breast-fed an unrestricted maternal diet.

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## Reaction #1

**Age 3 months:** Few hours after ingesting total 6-7 oz of the cow's milk formula:

- projectile, multiple emesis
- limp, pale
- PCP referred him to PED
- IVF bolus, inpatient admission
- extensive work up was negative: abdominal USG, ECG, CXR
- after 2 days d/c home, dx ALTE
- discharge dx was ALTE.

In the hospital he was given 2-3 oz of Term Cow Milk based formula x 1 feeding and has had no symptoms. After discharge formula was discontinued.

## Laboratory test results at 3 month hospitalization

08/25/23 23:08	Latest Reference Range & Units
PH, VBG7.3 - 7.4 pH	<b>7.29 (L)</b>
LACTATE, VBG0 - 1.9 mmol/L	<b>3.5 (H)</b>
BASE DEFICIT, VBG0 - 2.5 mmol/L	<b>4 (H)</b>
HEMOGLOBIN, VBG12 - 16 g/dL	<b>11.4 (L)</b>
METHEMOGLOBIN, VBG0 - 0.5 %	0.0
CARBOXYHEMOGLOBIN, VBG0 - 2.9 %	1.3
SODIUM, VBG135 - 145 mmol/L	<b>134 (L)</b>
POTASSIUM, VBG3.5 - 5 mmol/L	<b>5.1 (H)</b>
CHLORIDE, VBG96 - 109 mmol/L	102
GLUCOSE, VBG74 - 106 mg/dL	<b>109 (H)</b>
IONIZED CALCIUM, VBG1.11 - 1.3 mmol/L	<b>1.40 (H)</b>
TEMPERATURE, VBGC	37.0

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## Reaction #2

**Age 7 months:** On January 13 2024, Theo was fed whole milk yogurt and within 110 min woke up from a nap, throwing up, many time, bilious.

Unable to tolerate oral rehydration solution in the office. Taken to the ED, IVF, steroid.

He was given intramuscular epi and per mom, he felt better after it.

He was discharged home after several hours of observation.

The following day, his mother ingested cereal with 3/4 cup of milk and Wally vomited after being breastfed. Treated with po ondansetron at home.

After that, his mom eliminated all dairy from her diet.

## Theo: allergy evaluation

**Age 7 months (4 days after his reaction):**  
h/o mild AD, no topical CS, no rash on exam

### Diet:

- breast-feeding, supplemented with whey-based eHF with lactose
- no solids; Previously tolerated (starting from age 5-6 mo, tolerated banana, apple, sweet potato, avocado, spelt cereal, peanut x 1

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## Testing and diagnosis

### **SPT (mm):**

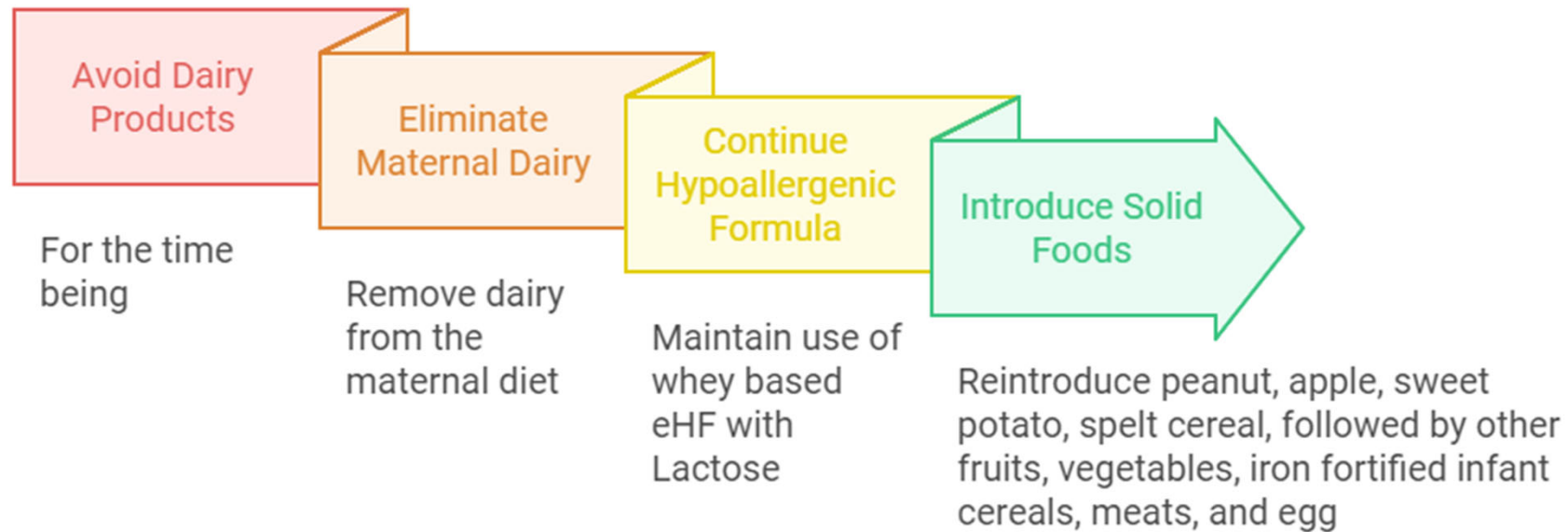
saline 0/0, histamine 5.5/20, cow's milk 4/22.5

### **Diagnosis:**

1. Infantile acute FPIES to cow's milk/dairy products-atypical, IgE+
2. Mild atopic dermatitis/eczema



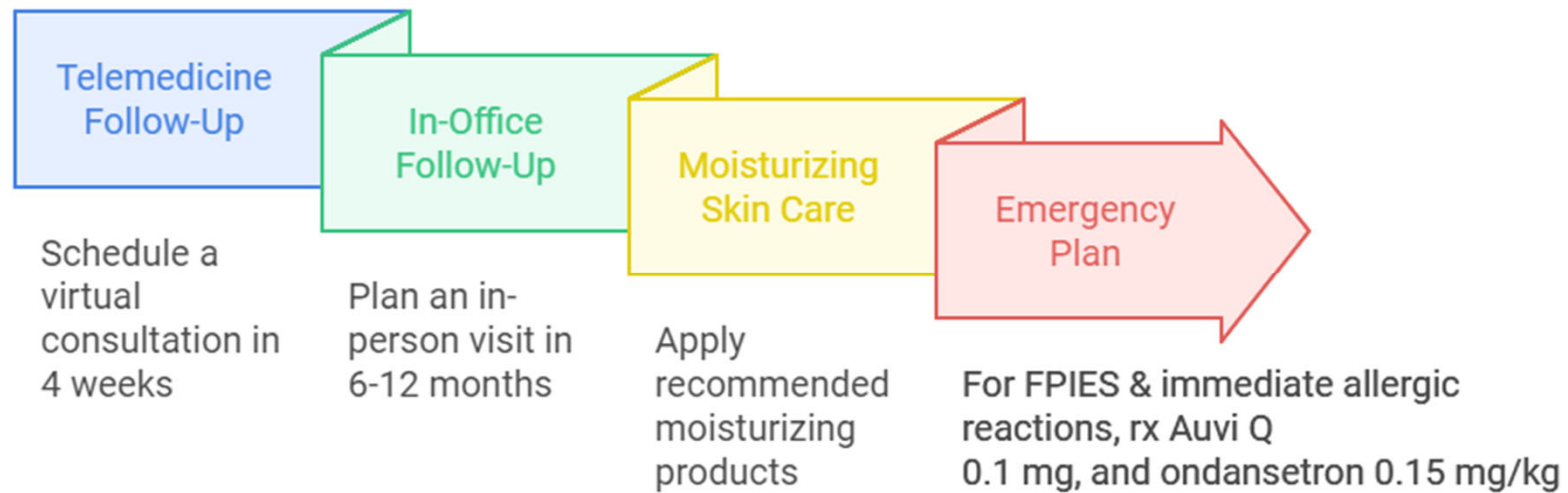
## Theo-recommendations



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# Theo-recommendations



# Emergency tx plan

## FPIES (Food Protein-Induced Enterocolitis Syndrome) ACTION PLAN

Name: \_\_\_\_\_ Date of Birth: \_\_\_\_\_ Weight: \_\_\_\_\_ lbs/kg (circle one)  
 AVOID these foods strictly: \_\_\_\_\_

History of Severe FPIES reactions: if checked, follow the severe symptoms treatment pathway and call 911 if the individual has ANY symptoms (mild or severe) after eating a food listed above.

IgE-mediated food allergy (i.e. has risk for anaphylaxis). Please refer to their Allergy & Anaphylaxis Emergency Plan if an individual has symptoms of hives, itching, coughing, wheezing, etc.; if unclear, use both ondansetron and anaphylaxis medications

### SEVERE FPIES SYMPTOMS

**What to look for:**  
 ▶ delayed onset (1-4 hours)  
 ▶ severe abdominal pain and/or nausea following food ingestion  
 ▶ repetitive vomiting  
 ▶ very pale or looks blue/grey  
 ▶ faintness  
 ▶ lethargy or unresponsiveness  
 or  
 ▶ unable to tolerate liquids

**What to do:**  
 1. **Call 911** (ask for Advanced Life Support) and transport to the nearest Emergency Room.  
 • OR drive to the nearest Emergency Room, if quicker  
 2. **Give dose of ondansetron (Zofran®)** as prescribed below  
 3. **Notify parents /emergency contact**  
 4. **Monitor symptoms**  
 • If sleepy or unresponsive, place individual on their side to prevent choking on vomit.  
 • If there has been no vomiting for 20-30 minutes, attempt to give clear liquids/ice-chips as tolerated.

### MILD FPIES SYMPTOMS

**What to look for:**  
 ▶ delayed onset (1-4 hours)  
 ▶ abdominal pain, nausea following food ingestion  
 ▶ vomiting  
 ▶ alert and responsive  
 and  
 ▶ tolerates liquids

**What to do:**  
 1. **Notify parents /emergency contact**  
 2. **Give dose of ondansetron (Zofran®)** as prescribed below  
 3. **Monitor symptoms**  
 • If sleepy, place individual on their side to prevent choking on vomit.  
 • If there has been no vomiting for 20-30 minutes, attempt to give clear liquids/ice-chips/breast milk as tolerated.  
**Call 911** if symptoms become severe, or individual appears dehydrated from repetitive vomiting (e.g., dry lips and tongue, not making saliva, tears, not urinating)

### MEDICATIONS:

**Ondansetron hydrochloride (Zofran®)**  
 Orally disintegrating tablet: 4 mg \_\_\_\_\_ 8 mg \_\_\_\_\_ placed on top of tongue  Liquid dose \_\_\_\_\_  
 May repeat the dose once if the individual vomits within 10 minutes of the initial dose. Maximum total dose 16 mg

**Acetaminophen (Tyleno®) Tablet** \_\_\_\_\_ **Liquid** \_\_\_\_\_

PROVIDER Name	Signature	Phone number	Date
SCHOOL NURSE Name	Signature	Phone number	Date
PARENT/GUARDIAN Name	Signature	Phone number	Date

I authorize the school to follow Plan and contact the Health Care Provider, and release the school district and personnel from civil liability  
**DO NOT HESITATE TO ADMINISTER MEDICATION OR CALL 911**

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## FARE FOOD ALLERGY & ANAPHYLAXIS EMERGENCY CARE PLAN

Name: \_\_\_\_\_ D.O.B.: \_\_\_\_\_  
 Allergy to: \_\_\_\_\_  
 Weight: \_\_\_\_\_ lbs. Asthma:  Yes (higher risk for a severe reaction)  No

PLACE PICTURE HERE

NOTE: Do not depend on antihistamines or inhalers (bronchodilators) to treat a severe reaction. USE EPINEPHRINE.

Extremely reactive to the following foods: \_\_\_\_\_  
 THEREFORE:  
 If checked, give epinephrine immediately for ANY symptoms if the allergen was likely eaten.  
 If checked, give epinephrine immediately if the allergen was definitely eaten, even if no symptoms are noted.

**FOR ANY OF THE FOLLOWING: SEVERE SYMPTOMS**

**LUNG**  
Short of breath, wheezing, repetitive cough

**HEART**  
Pale, blue, faint, weak pulse, dizzy

**THROAT**  
Tight, hoarse, trouble breathing/swallowing

**MOUTH**  
Significant swelling of the tongue and/or lips

**SKIN**  
Many hives over body, widespread redness

**GUT**  
Repetitive vomiting, severe diarrhea

**OTHER**  
Feeling something bad is about to happen, anxiety, confusion

OR A COMBINATION of symptoms from different body areas.

- INJECT EPINEPHRINE IMMEDIATELY.**
- Call 911.** Tell them the child is having anaphylaxis and may need epinephrine when they arrive.

- Consider giving additional medications following epinephrine:
  - Antihistamine
  - Inhaler (bronchodilator) if wheezing
- Lay the person flat, raise legs and keep warm. If breathing is difficult or they are vomiting, let them sit up or lie on their side.
- If symptoms do not improve, or symptoms return, more doses of epinephrine can be given about 5 minutes or more after the last dose.
- Alert emergency contacts.
- Transport them to ER even if symptoms resolve. Person should remain in ER for at least 4 hours because symptoms may return.

**MILD SYMPTOMS**

**NOSE**  
Itchy/runny nose, sneezing

**MOUTH**  
Itchy mouth

**SKIN**  
A few hives, mild itch

**GUT**  
Mild nausea/discomfort

**FOR MILD SYMPTOMS FROM MORE THAN ONE SYSTEM AREA, GIVE EPINEPHRINE.**

**FOR MILD SYMPTOMS FROM A SINGLE SYSTEM AREA, FOLLOW THE DIRECTIONS BELOW:**

- Antihistamines may be given, if ordered by a healthcare provider.
- Stay with the person; alert emergency contacts.
- Watch closely for changes. If symptoms worsen, give epinephrine.

**MEDICATIONS/DOSES**

Epinephrine Brand: \_\_\_\_\_  
 Epinephrine Dose:  0.15 mg IM  0.3 mg IM

Antihistamine Brand or Generic: \_\_\_\_\_  
 Antihistamine Dose: \_\_\_\_\_

Other (e.g., Inhaler bronchodilator if wheezing): \_\_\_\_\_

PRENENT/GUARDIAN AUTHORIZATION SIGNATURE \_\_\_\_\_ DATE \_\_\_\_\_ PHYSICIAN/HCP AUTHORIZATION SIGNATURE \_\_\_\_\_ DATE \_\_\_\_\_  
 FORM PROVIDED COURTESY OF FOOD ALLERGY RESEARCH & EDUCATION (FARE) (WWW.FOODALLERGY.ORG) 5/2014

## Reaction #3

Age 13 months:

6/25/24-Theo was fed **a slice of bread with milk as a second ingredient** at 8 am and by 11 am (in the daycare) he became very lethargic, sleepy, then started to vomit x several times, stopped after taking ondansetron.

Mom arrived and has administered Auvi Q, then took him to ED where he was given IVF.

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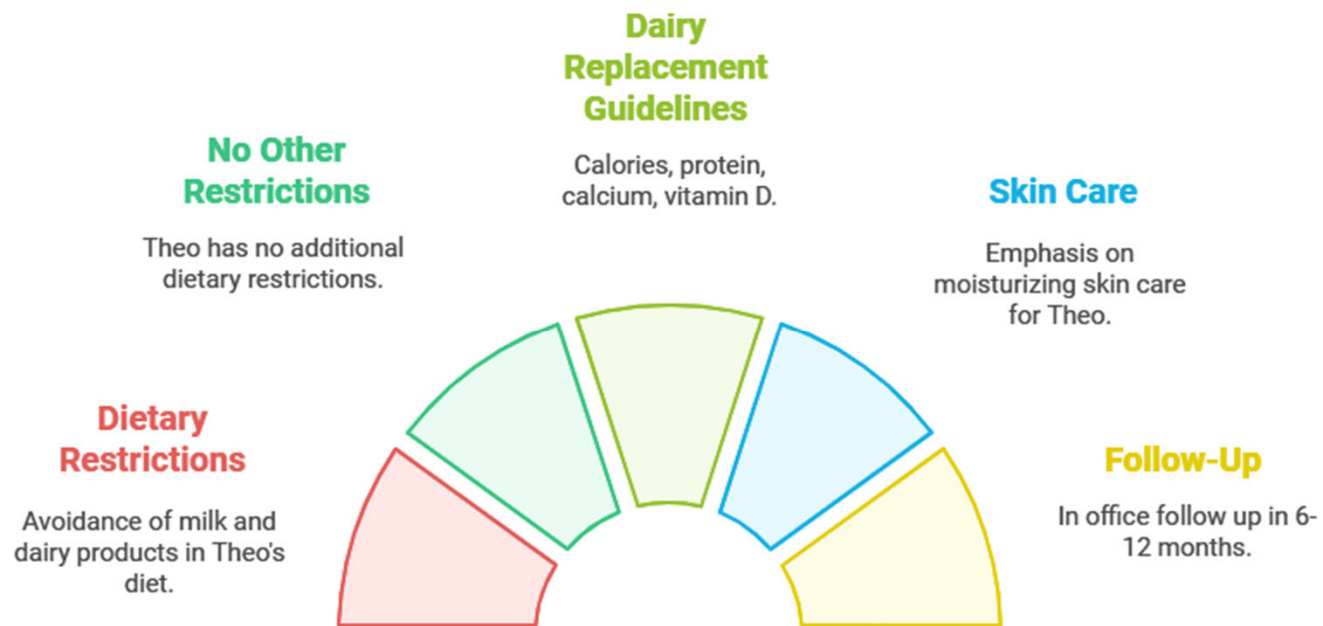
## Reaction #3: lab test results

	06/25/24
WHITE BLOOD CELL COUNT	<b>20.2 (H)</b>
RED BLOOD CELL COUNT	4.31
HEMOGLOBIN	11.5
HEMATOCRIT	35.4
PLATELET COUNT	334
NEUTROPHILS %	59
LYMPHOCYTES %	<b>23 (L)</b>
MONOCYTES %	<b>15 (H)</b>
EOSINOPHILS %	0
BASOPHILS %	0
NUCLEATED RBC,ABSOLUTE	<b>0.00 (L)</b>
DIFFERENTIAL TYPE	MANUAL
LYMPHOCYTE ABSOLUTE CALCULATED	5.3
ATYPICAL LYMPHOCYTES %	<b>3 (H)</b>
NEUTROPHIL ABSOLUTE CALCULATED	<b>11.9 (H)</b>
ALLERGEN MILK COW IGE	<b>5.31 (H)</b>
IMMUNOGLOBULIN E	<b>129 (H)</b>
Tryptase (AA1)	<b>14.6 (H)</b>

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# Theo-recommendations



Continue emergency plan for FPIES and for immediate allergic reactions, rx Auvi Q 0.1 mg, and ondansetron 0.15 mg/kg

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## Take Home Messages

- Diagnosis of FPIES is based on the recognition of phenotype, awareness of difference in symptoms, onset and natural history
- Infantile FPIES-favorable prognosis, re-evaluate within 12-24 months
- Adult-onset FPIES: more guarded prognosis
- Unmet needs: biomarkers, standardized OFC protocol

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Annals of Allergy, Asthma & Immunology

Available online 12 January 2021

In Press, Corrected Proof

Review

The evolution of food protein–induced enterocolitis syndrome: From a diagnosis that did not exist to a condition in need of answers

Lisa M. Bartnikas MD <sup>\*,†</sup>, Anna Nowak-Węgrzyn MD, PhD <sup>‡,§</sup>, Fallon Schultz MSW, LCSW, CAM <sup>||</sup>, Wanda Phipatanakul MD, MS <sup>\*,†</sup>, Theresa A. Bingemann MD <sup>¶,‡,‡</sup>

THANK YOU FOR YOUR ATTENTION!

