



SCHOOL NURSE
Workshop

Food Allergies

Amy CaJacob, MD

June 5, 2024



Children's
of Alabama®



Food Allergies

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School Nurses Workshop
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MY Objectives for YOU

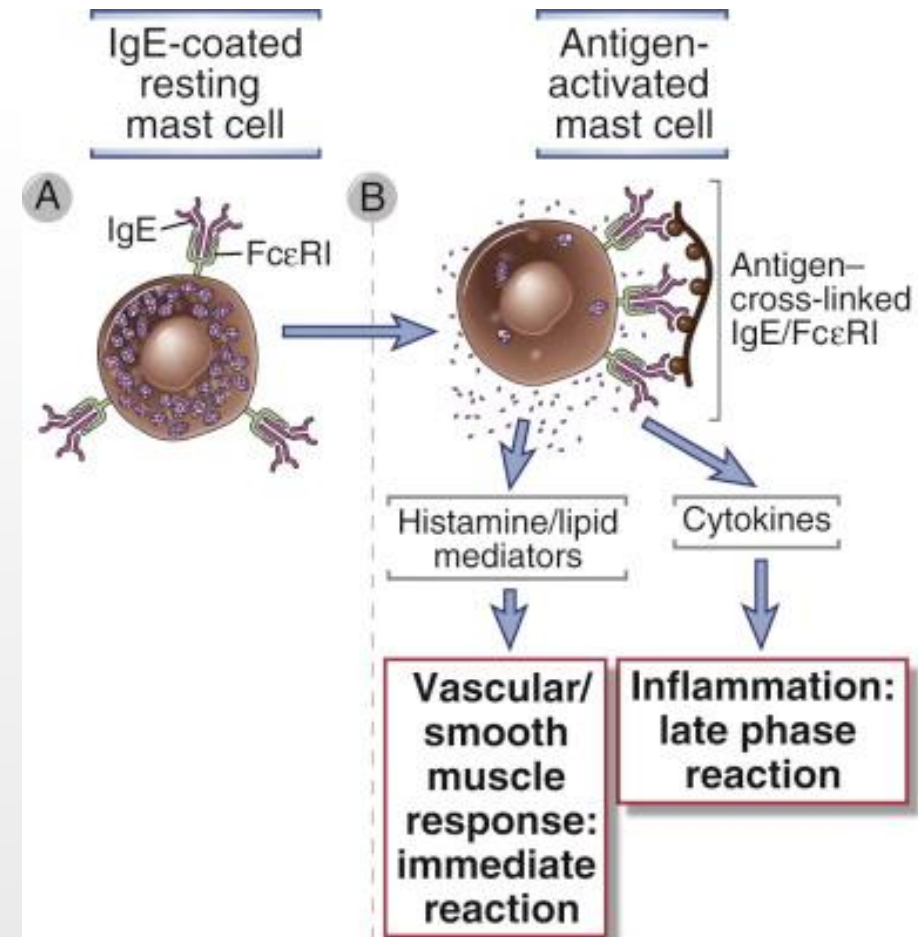
- Recognize that only a small number of foods cause the majority of food allergic reaction
- HOW we diagnose food allergy
- School specific challenges
- Discuss the treatment of allergic reactions (anaphylaxis)

BIG PICTURE – The “Allergic” Mechanism

- IgE-mediated

- Top 8 foods:

1. Milk – 2.5%
2. Egg - 2.5%
3. Peanut – 1.7%
4. Tree Nut – 1.5%
5. Soybean – 0.7%
6. Fish
7. Shellfish
8. Wheat
- 9. Sesame



BIG PICTURE – Food Intolerances

- NON-IgE mediated Adverse Reactions
 - Intolerances:
 - Citrus fruits, berries (strawberry), tomato
 - Lactose
 - Cows Milk Protein “Allergy” (Proctocolitis)
 - Food protein-induced enterocolitis syndrome (FPIES)
 - Eosinophilic Esophagitis (EoE)

Diagnosis of IgE-Mediated Food Allergy

- History, history, history!
- Skin prick testing
- Serum specific-IgE (“RAST”) – blood allergy testing
- Oral Food Challenge

Food Allergy - HISTORY

- Should be IMMEDIATE onset...within 30-60 minutes...not 3 hours later
- Most food allergic reactions occur upon the first known ingestion!!!
- Clinical symptoms
 - Anaphylaxis = cutaneous + 1 other organ system!
 - Cutaneous: pruritus (without a rash), flushing, morbilliform rash, hives, angioedema
 - + CV: hypotension, tachycardia
 - + Respiratory: upper (itchy eyes/nose, rhinorrhea), lower (cough, wheezing, chest tightness)
 - + GI: nausea, vomiting, diarrhea



Specific Food Allergens

You SHOULD outgrow...



You usually
DON'T outgrow...



Milk



























































- Anaphylaxis vs. intolerance
- Most lose their milk allergy by age 2, total of 50-85% outgrow by age 5 years
- 75% can tolerate BAKED forms of milk
 - 28x more likely to outgrow allergy
- Other mammalian milks (ex: goat) not a good substitute – will likely cross-react

Egg

- Egg white, not the yolk!
- 70% can tolerate baked egg
 - Baked = 350°F for 30 minutes
 - Unbaked – scrambled/fried eggs (French toast)
 - Baked – cookies, cakes, pastries, goldfish
 - 16x more likely to outgrow allergy
- Majority outgrow their allergy by age 5

Peanut

- Majority of reactions with first known ingestion
- Reaction can be SEVERE – most common cause of FATAL food-induced anaphylaxis
- Only 20% outgrow!
- OK with highly refined peanut oil
- Current recommendations: introduce between 4-11 months of age!

If Allergic to:	Risk of Reaction to at Least One:	Risk:
A legume* peanut 	Other legumes peas  lentils  beans 	5% 
A tree nut walnut 	Other tree nuts brazil  cashew  hazelnut 	37% 
A fish* salmon 	Other fish swordfish  sole 	50% 
A shellfish shrimp 	Other shellfish crab  lobster 	75% 
A grain* wheat 	Other grains barley  rye 	20% 
Cow's milk* 	Beef hamburger 	10% 
Cow's milk* 	Goat's milk goat 	92% 
Cow's milk* 	Mare's milk horse 	4% 
Pollen birch  ragweed 	Fruits/vegetables apple  peach  honeydew 	55% 
Peach* 	Other Rosaceae plum  pear  apple  cherry 	55% 
Melon* cantaloupe 	Other fruits watermelon  banana  avocado 	92% 
Latex* latex glove 	Fruits kiwi  banana  avocado 	35% 
Fruits kiwi  avocado  banana 	Latex latex glove 	11% 

Peanut → Tree Nut
50% risk

Tree Nuts

- Not generally outgrown; often are allergic to one but not the others
- Cross-reactive pairs within the tree nuts:
 - Cashew – Pistachio
 - Walnut – Pecan
 - Almond
 - Hazelnut
- School avoidance strategy: Avoid ALL tree nuts + peanuts...young kids/school staff may not know the difference!

Fish & Shellfish

- Cooked versions are MORE allergenic
- Generally NOT outgrown, persist into adulthood
- Anyone at any age can become food allergic, particularly with fish/shellfish
- MYTH: NO relation to iodine or contrast!

Treatment

- Primary/Secondary prevention with early introduction of top allergenic foods
- Regular consumption of baked egg or milk product if tolerated
- Strict avoidance – Epinephrine prn anaphylaxis
- Oral Immunotherapy – in clinical trials



SCHOOL STATS

Legal Rights

- ADA of 1990 and ADAA of 2008 both apply – students with FA have a *disability* restricting their diet
 - With written documentation from MD, school must provide FREE case-specific dietary substitutions in school meal/snack programs
- Section 504 of the US Rehabilitation Act of 1973
- School Access to Emergency Epinephrine Act (SAEEA) of 2013 – federal financial incentives for states to create laws requiring school to stock unassigned epinephrine auto-injectors

Communication - A Team Approach!

- MD role
 - Epinephrine rx
 - Medication forms
 - Written allergy and anaphylaxis emergency plan
 - Assist schools with effective avoidance
- Parental anxiety
- Food-allergic child
- School nurse
- School staff/administration – IHP, 504

Allergen Avoidance

- School-wide bans
 - No data that this is effective, higher rates of epi use and accidental ingestions
 - Downfalls: undue burden on non-FA families, false sense of security, impractical with multiple foods
- Table/room-specific
 - Data shows fewer epinephrine administrations compared to schools without peanut-free tables
- “Allergen safe zones” – library, classrooms

Allergen Avoidance

- Cross-contamination – shared cups/utensils
- Non-oral routes: low risk
 - But must avoid actively cooking/heating known FA
- Hidden allergens in art/science projects: play dough, paste, shaving cream, finger paint, animal feeds (nuts/seeds)

Allergen Avoidance

- Conventional cleaning methods are effective at removing allergen!
- Encourage hand washing with soap and water or commercial wipes
- Hand sanitizer or water alone not effective!!

Accidental Ingestions

- 16-18% of children with FA have had a reaction from accidentally eating the food while at school
 - Most common place: the classroom
 - Rest in lunchroom, field trips, playground
 - Up to 25% during a “break” from normal procedures, ex: bday celebrations



EMERGENCY MANAGEMENT

Ana-phylaxis Clinical Pearls

- Pro-phylaxis is key!
- Food allergy – Most common cause of anaphylaxis
- 25% of school anaphylaxis is child's first time reaction (ex: new food, fire ant bite/sting)
- Cannot predict the SEVERITY of future reactions based on testing OR past reactions

Treatment Overview

- Epinephrine – do not delay!
- Epinephrine
- Epinephrine
- Epinephrine
- Epinephrine
- Epinephrine
- H1/H2 antihistamines, Steroid, IVF, Albuterol nebs, O₂, Glucagon

Treatment of anaphylaxis

- Epinephrine IM

- 0.01 mg/kg/dose (of 1 mg/mL conc)
- <14 kg give 0.1 mg
 - Auvi-Q (only goes to ASPN mail order pharmacy)
- <= 14-25 kg give 0.15 mg
 - Auvi-Q
 - Epi Pen Jr
 - Generic epinephrine autoinjector
- >= 25 kg give 0.3 mg
 - Auvi-Q
 - Epi Pen
 - Generic epinephrine autoinjector
- NO steroids, H2 blockers



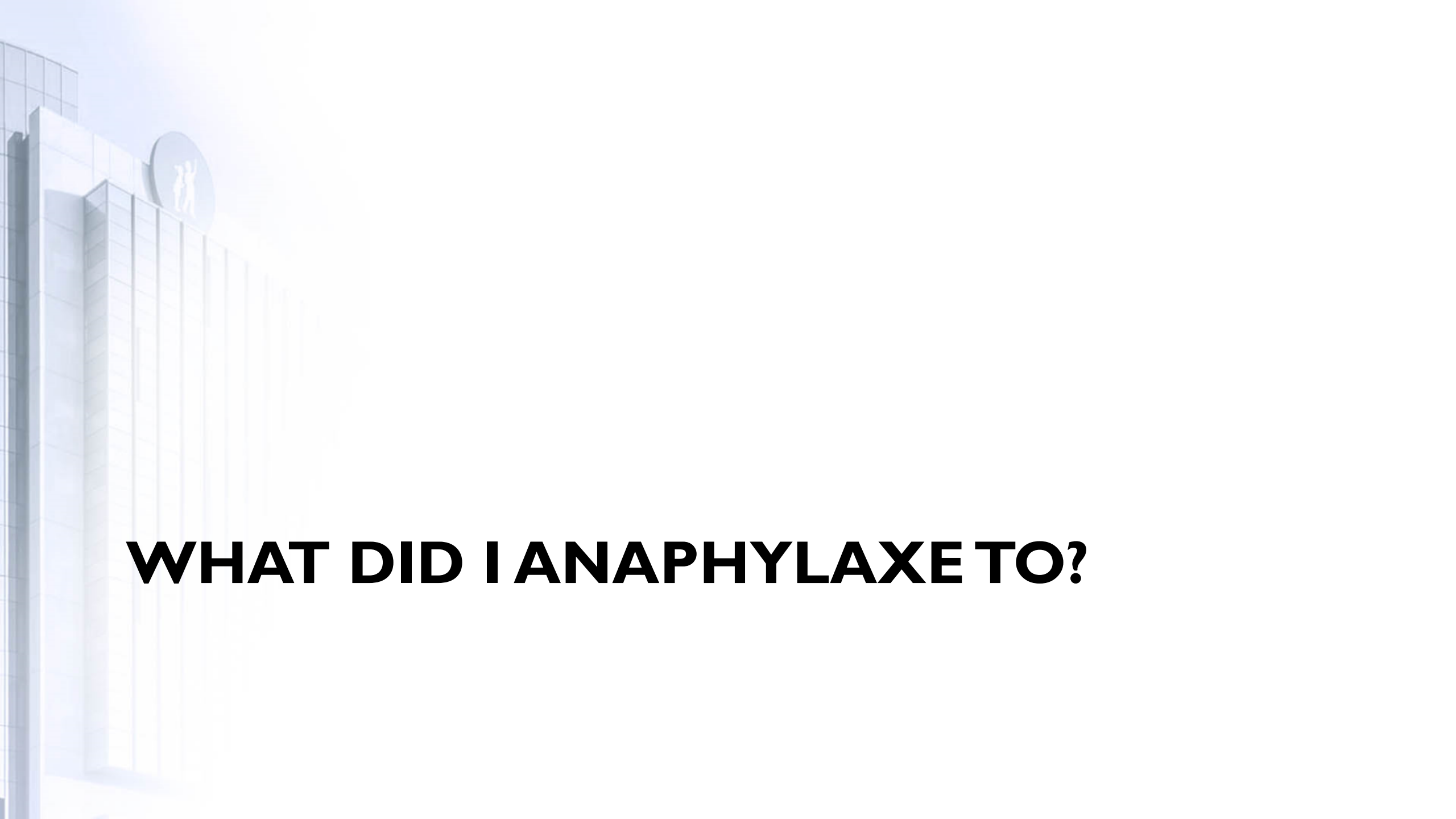


UAB MEDICINE
PEDIATRICS



Other Considerations

- Teens & young adults at particular risk of fatal food-induced allergic reactions!
- #1 risk factor for FATAL food reaction = delayed use of epinephrine
 - Other RF: asthma, male
 - Do NOT give antihistamine to treat anaphylaxis!
- FA children have lower QOL, higher rates of bullying, greater anxiety



WHAT DID I ANAPHYLAXE TO?

What did I anaphylaxe to?



Nutrition Facts

About 10	
Serving size	2 tbsp (28g)
Amount per serving	
Calories	70
% Daily Value*	
Total Fat 5g	6%
Saturated Fat 1g	5%
Trans Fat 0g	
Cholesterol 0mg	0%
Sodium 120mg	5%
Total Carbohydrate 4g	1%
Dietary Fiber 1g	4%
Total Sugars 0g	
Includes 0g Added Sugars	0%
Protein 2g	
Vit. D 0%	• Calcium 0%
Iron 4%	• Potas. 2%

INGREDIENTS:

COOKED CHICKPEAS (WATER, CHICKPEAS), WATER, TAHINI (GROUND SESAME), SOYBEAN OIL, GARLIC, SALT, CITRIC ACID, POTASSIUM SORBATE TO MAINTAIN FRESHNESS.



What did I anaphylaxe to?



Chick-fil-A® Nuggets Kid's Meal [+](#) Add to Meal Calculator

100% natural whole breast filet, seasoning (salt, monosodium glutamate, sugar, spices, paprika), seasoned coater (enriched bleached flour [bleached wheat flour, malted barley flour, niacin, iron, thiamine mononitrate, riboflavin, folic acid], sugar, salt, monosodium glutamate, nonfat milk, leavening [baking soda, sodium aluminum phosphate, monocalcium phosphate], spice, soybean oil, color [paprika]), milk wash (water, egg, nonfat milk), peanut oil (fully refined peanut oil with TBHQ and citric acid added to preserve freshness and Dimethylpolysiloxane an anti-foaming agent added).

What did I anaphylaxe to?



INGREDIENTS: MILK CHOCOLATE [SUGAR; COCOA BUTTER; CHOCOLATE; NONFAT MILK; MILK FAT; LACTOSE; LECITHIN (SOY); PGPR, EMULSIFIER]; PEANUTS; SUGAR; DEXTROSE; SALT; TBHQ AND CITRIC ACID, TO MAINTAIN FRESHNESS. (U) D

Partially produced with genetic engineering.

GLUTEN FREE

What

INGREDIENTS: ICING SUGAR (SUGAR, CORN STARCH), SUGAR, WATER, BLEACHED ENRICHED WHEAT FLOUR (WHEAT FLOUR, NIACIN, REDUCED IRON, THIAMINE MONONITRATE, RIBOFLAVIN, FOLIC ACID), EGG, SOYBEAN OIL AND/OR CANOLA OIL, VEGETABLE OIL SHORTENING (CANOLA OIL, PALM OIL, PALM KERNEL OIL, MONOGLYCERIDES, POLYSORBATE 60), CORN SYRUP, CONTAINS 2% OR LESS OF: MARGARINE (SOYBEAN OIL, PALM OIL, WATER, SALT, WHEY, SOYBEAN LECITHIN, MONOGLYCERIDES, NATURAL FLAVOR, VITAMIN A PALMITATE, VITAMIN D₃), MODIFIED CORN STARCH, WHEY, NONFAT DRY MILK, PALM KERNEL OIL, LEAVENING BLEND (SODIUM ACID PYROPHOSPHATE, SODIUM BICARBONATE, CORN STARCH, MONOCALCIUM PHOSPHATE, CALCIUM SULFATE), MONO- AND DIGLYCERIDES, SALT, EMULSIFIER (PROPYLENE GLYCOL MONO- AND DIESTERS OF FATS AND FATTY ACIDS, MONO- AND DIGLYCERIDES, SOYBEAN LECITHIN, CITRIC ACID [PRESERVATIVE]), BUTTER (CREAM, SALT), NATURAL FLAVOR, SOYBEAN LECITHIN, CORNSTARCH, SHELLAC, SUNFLOWER LECITHIN, BLUE 1 AND/OR RED 3 AND/OR RED 40 AND/OR YELLOW 5 AND/OR YELLOW 6 AND/OR BLUE 1 LAKE AND/OR BLUE 2 LAKE AND/OR RED 40 LAKE AND/OR YELLOW 5 LAKE AND/OR YELLOW 6 LAKE AND/OR BEET JUICE CONCENTRATE (COLOR) AND/OR BEET POWDER (COLOR) AND/OR BETA-CAROTENE (COLOR) AND/OR MICA-BASED PEARLESCENT PIGMENTS (COLOR) AND/OR TITANIUM DIOXIDE (COLOR), POLYSORBATE 60.

CONTAINS MILK, EGGS, WHEAT AND SOY.

What else will I anaphylaxe to?



What did I anaphylaxe to?



Resources

- <https://www.nasn.org/nasn-resources/resources-by-topic/allergies-anaphylaxis>
- www.aaaai.org/conditions-and-treatments/school-tools
- www.foodallergy.org/managing-food-allergies/at-school
- www.allergyhome.org

References

- Food allergy: a practice parameter. *Ann Allergy Asthma Immunol* 2006; 96(3 suppl 2): S1-S68
- Hill DJ, Heine RG, Hosking CS. The diagnostic value of skin prick testing in children with food allergy. *Pediatr Allergy Immunol*
- UpToDate
- LEAP Trial