Food Triggers: The Degree of Avoidance

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Objectives

• Identify ingredients that require avoidance

• Identify ingredients that are typically tolerated

• Understand the meaning of precautionary statements

• Understand the risk of cross reactive food proteins
Major Allergens in the US

- Milk
- Egg
- Wheat
- Soy
- Peanut
- Tree nut
- Fish
- Crustacean shellfish
<table>
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<tr>
<th>Major Allergens</th>
<th>US</th>
<th>EU</th>
<th>Australia</th>
<th>Canada</th>
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<tbody>
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<td>Milk, Egg, Wheat, Soy, Peanut, Tree nut, Fish, Crustacean shellfish</td>
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Minor Allergens

- Do not require full disclosure on product labels.
- Vague ingredient terms:
  Natural flavoring, coloring, spice, or processing aid.
Allergen Sensitivity

• Allergen contamination may be present in manufactured foods
• Tolerance varies widely across the sensitized population.
• Studies indicate that less than a milligram of milk, egg, or peanut, can induce symptoms in some highly sensitive individuals, while others may not experience a reaction until more than 10 grams have been ingested.

Difficulties in Establishing Thresholds

• Safety assessment-based approach
  ▪ No Observed Adverse Effect Level (NOAEL)
  ▪ Lowest Observed Adverse Effect Level (LOAEL)

• Once a NOAEL is established, does industry have the ability to test for these levels of allergens in their products?
Cross contact

• Precautionary labeling such as
  – May contain…
  – Manufactured in a facility…
  – Manufactured on shared equipment…

• Voluntary and unregulated
Precautionary Labels

The NIAID guidelines suggest avoiding *any product* that has a precautionary label for your allergen.
When is strict avoidance potentially unnecessary?

- Certain types of mild allergy may not require strict avoidance, such as pollen-food related syndrome.

- In certain patients with milk or egg allergy who have been challenge-proven to tolerate baked milk and egg ingredients.

A survey on the management of pollen-food allergy syndrome in allergy practices.
Changing paradigms

- **Baked-Milk study**
  - ~75% of milk-allergic children tolerate baked milk
  - Accelerates tolerance (16-fold vs. avoidance)

- **Baked-Egg study**
  - ~75% of egg-allergic children tolerate baked egg
  - Accelerates tolerance (15-fold vs. avoidance)
To Avoid or Not to Avoid

- Patient with milk allergy who tolerates baked milk?
  - Do we avoid products with precautionary labels for milk?
  - Read labels carefully for un-baked milk
To Avoid or Not to Avoid
To Avoid or Not to Avoid

• A patient with **corn allergy**?
  – Corn oil or corn syrup?

• A patient with **soy allergy**?
  – Soy oil or soy lecithin?

• A patient with **peanut allergy**?
  – Peanut oil?

To Avoid or Not to Avoid

• Label does not tell you how the oil was processed

• Peanut oil
  - Crude oils: Expeller pressed, un-refined, gourmet - AVOID
  - Refined- Not considered an allergen

Sicherer SH. Clinical implications of cross-reactive food allergens. JACI 2001;108:881-890
To Avoid or Not to Avoid

• A patient w/ **Sesame allergy**
  – Sesame oil?

• A patient w/ **Egg allergy**
  – Egg white or egg yolk?

Sicherer SH. Clinical implications of cross-reactive food allergens. *JACI* 2001;108:881-890
To Avoid or Not to Avoid

A patient with **Cow’s Milk Allergy**
  - Goat milk or sheep milk?

A patient w/ **Peanut allergy**?
  - Tree nuts or other Legumes?

Sicherer SH. Clinical implications of cross-reactive food allergens. *JACI* 2001;108:881-890
Breastfeeding- Is maternal avoidance necessary?

- Immunologically active proteins can be found in breast milk.
- Anaphylaxis can occur in the infant to breast milk from maternally ingested allergen.
- Chronic symptoms may also occur.
- The amount present is variable.
- If the infant with allergy does not have any symptoms to the breast milk with an unrestricted maternal diet, then avoidance is not necessary.
- Maternal avoidance is rarely required for FPIES.
Contact allergy

• Assessed the significance of contact sensitivity to peanut butter in children sensitized to peanut.
• 1 g peanut butter applied directly to the skin for 15 minutes of children (n=281) who were SPT positive to peanut.
• A subset of children (N=85) underwent open-label oral challenge to confirm peanut allergy.

Contact allergy

• A minority of children sensitized to peanut develop localized urticaria from prolonged skin contact with peanut butter.

• No tested subjects, including ones with systemic reactions upon oral challenge, developed a systemic reaction to prolonged skin exposure to peanut.


Contact allergy

HOWEVER...

If peanut butter gets onto the hands and is unintentionally placed into the mouth or rubbed in the eyes, this is more akin to an ingestion rather than skin contact.

Airborne allergens

• DBPC study (n=30) of children with history of severe reaction to peanut ingestion were challenged by close proximity/smelling peanut butter
• A six inch square area of peanut butter hidden with sheer gauze was placed 12 inches from face for 10 minutes.
• No child experienced symptoms from proximity/smelling of peanut butter
• One subject experienced throat symptoms during exposure to placebo

Airborne samples

• Simulated environments when peanut might be eaten in a preschool or school environment: peanut butter sandwiches, open jars of peanut butter, packages of shelled peanuts, shelling peanuts.

• Ara h 1 was undetectable under all simulated environmental settings.

However... May depend on the degree of exposure

- Reactions to airborne peanut protein have been reported in relation to commercial airliners, when many packets of roasted peanuts are opened simultaneously.

- Peanut dust may become airborne

- Filters in these commercial airlines contain measurable amounts of peanut protein.

Airborne allergens

“Scent vs. Aerosolized”

- Fragrance and scents from food result in contact with airborne volatile organic compounds (VOC)- not known to cause allergic reactions
- During cooking or processing of foods, inhalation of actual food protein particles may occur (aerosolization).
- Inhalation contact with aerosolized food has been shown to be capable of inducing asthmatic or respiratory reactions in highly sensitive individuals.

Medications

• Common food ingredients in medications- soy lecithin and lactose

• Lactose- pharmaceutical grade lactose is considered to contain very little protein

• Reactions to lactose in dry powder inhalers has been documented.

Other items not covered under FALCPA

- Cosmetics
- Shampoos and lotions and toothpaste
- Toiletry items
- Pet foods
- Any food item not regulated by the FDA such as fresh meats and produce (regulated by USDA)
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