



## **Anaphylaxis: Recognition and Treatment**

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## **How Common is Anaphylaxis**

- Food allergy is believed to be the leading cause of anaphylaxis outside the hospital setting, causing an estimated 50,000 emergency department visits each year in the U.S.
- Approximately 100 people in the United States die each year from food-related anaphylaxis.



## Common Causes of Anaphylaxis

- Any food can cause a severe reaction in someone allergic to it.
- Only a trace amount of a problem food is enough to cause a reaction in some people.
  - Peanuts
  - Tree nuts (almonds, walnuts, etc.)
  - Shellfish
  - Fish
  - Milk
  - Eggs



## Anaphylaxis and Death

- Two recent FAAN studies involving a total of 63 cases of fatal food-allergy-induced anaphylaxis showed that adolescents who have peanut and tree nut allergy and asthma, and who **don't have quick access to epinephrine** during a reaction, are at **highest risk for a fatal reaction.**



## What is anaphylaxis?

- Anaphylaxis is a serious allergic reaction that is rapid in onset and may cause death.
- Symptoms usually start within **5 to 30 minutes** of coming into contact with the thing to which you are allergic
- It may take **more than an hour** to notice anaphylactic symptoms



## What is happening in my body during anaphylaxis?

- <http://www.foodallergy.org/Food.htm>
- Most people with allergies make tiny molecules, called IgE antibodies, that are like tiny antennae that can tell when the food a person is allergic to comes into his or her body. These antennae sit on cells called "mast cells", which are spread throughout the body.
- Mast cells are filled with chemicals. Some of those chemicals are histamine. When someone with a food allergy eats that food, the proteins (the part of the food that causes the allergy) attach to the IgE on the mast cell.
- This causes the mast cell to explode, sending chemicals throughout the body. The chemicals then cause the symptoms of the allergy.



## Symptoms of Anaphylaxis

- A red rash, with welts, that is usually itchy
- Swollen throat or swollen areas of the body
- Wheezing
- Passing out
- Chest tightness
- Trouble breathing
- A hoarse voice
- Trouble swallowing
- Vomiting
- Diarrhea
- Stomach cramping
- A pale or red color to the face and body




## Treatment of Anaphylaxis

- Epinephrine is the drug of choice for treating an anaphylactic reaction.
- It works to reverse the symptoms and helps to prevent its progression.
- **It is important to administer epinephrine as soon as one detects the symptoms of anaphylaxis.**



## Treatment, cont.

- Antihistamines (such as Benadryl®)
- Steroids (such as prednisone)
- Antihistamines and asthma medications (such as albuterol) may be administered with epinephrine, but never instead of epinephrine, because they cannot reverse many of the symptoms of anaphylaxis.



## How can I determine if I have a food allergy?

- Skin testing (allergist performs this test)
- RAST testing (labwork that can be ordered by allergist, GI specialist, or PCP)



## How do I prevent anaphylaxis?

- AVOIDANCE!!!
- Strict avoidance of the allergen is necessary to avoid a severe reaction.
- Read food labels for every food each and every time you eat it.
- Ask questions about ingredients and preparation methods when eating away from home.



## Great Resources

- American Academy of Allergy, Asthma, and Immunology. <http://aaaai.org>
- The Food Allergy and Anaphylaxis Network. <http://www.foodallergy.org>
- The Allergy, Asthma, and Sinus Center. <http://www.allergyasc.com>

# Psychological Aspects of Living with Food Allergies

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5/6/2009

1

## Outline

- Emotional experiences of living with food allergies
- Challenges within the family and social contexts
- Coping strategies

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2



## Impact of Food Allergies

- True food allergy affects 6%-8% of young children<sup>1</sup> and 1%-4% in adults<sup>2</sup>
- Some studies have shown that adults and children suffering from food allergy show impaired quality of life and a higher level of stress and anxiety<sup>3</sup>
- FOOD IS EVERYWHERE!!!

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## Impact of Food Allergies

- Home/Family life
- Social contexts
- School
- Work

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## Emotional Experiences- Children and Teens

- Denial
- Confusion
- Anxiety
- Anger
- Embarrassment
- Frustration/Stress
- Loss
- Sadness

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5



## Emotional Experiences - Parents

- Denial
- Confusion
- Anxiety/Fear
- Anger
- Guilt
- Sadness
- Stress/Overwhelm
- Protectiveness

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6

## Emotional Experiences - Siblings

- Protectiveness
- Anxiety
- Confusion
- Anger
- Loneliness
- Jealousy

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7

## Life Events

- Ordinary life events may have unusual impact.
  - Going out to eat at a restaurant
  - A move of the family
  - Change in job
  - Birth of a sibling
  - Family vacation
  - Birthday parties
  - Summer camp

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8

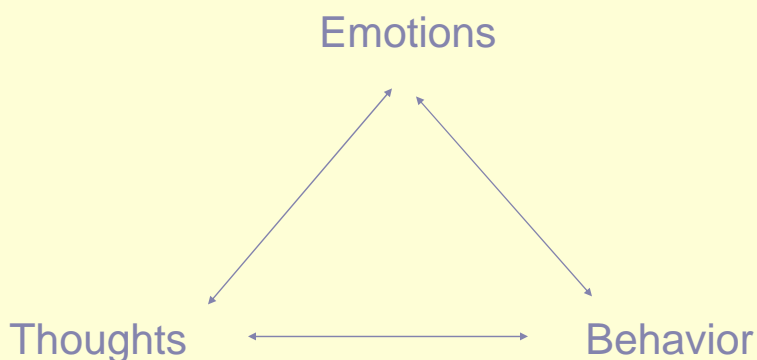
## Emotional Experiences - Everyone

- Emotions will ebb and flow depending on what is happening in life
- There is a wide range of “normal”
- Emotions become problematic when they influence a person’s behavior, relationships, and functioning in school, work, or home in a significantly negative way

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9

## The Triangle



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10

## The Interaction

- Emotions and thoughts affect behavior:
  - Denial – “This isn’t a true food allergy. I didn’t react so badly the first time. I’ll try it again because (it tastes so good, I like it) and I bet I’ll be fine.”
  - Anger – “I’m sick of being different and not being able to eat like my friends. I’m going to eat “X” anyway!”
  - Anxiety – “Are you absolutely sure it doesn’t have wheat/milk/etc.. in it? Well, I’m just not going to eat anything at all.”

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11

## Coping

- Tends to be harder:
  - if the allergic reaction is anticipated to be life-threatening or very severe OR
  - if the list of foods that one is allergic to is lengthy and exhaustive

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12

## Coping in Adolescence

- Coping and managing food allergies can be especially difficult for pre-teens and teens
  - There is a **STRONG** need to be “normal” and be like everyone else
  - Anything that is unique or different is commonly viewed as bad
  - Having a food allergy and having a restricted diet may exacerbate feelings of being different
  - Feelings of being different can affect self-esteem and impact a teen's social world

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13

## How to Increase Coping Skills

- **Provide ongoing, age-appropriate information and education**
  - Knowledge is Power
  - Be careful of the language you use
- **Adopt clear behavioral/environmental plans to maximize safety**
  - Carrying EpiPens, wearing medical ID bracelets, educating caregivers/school personnel/friends about allergies, cross-contaminations and how to assist if an accidental exposure occurs

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14



## How to Increase Coping Skills

- **Be aware of parental stress and anxiety and it's impact on children/teen coping**
- **Involve the entire family – especially siblings**
  - It's important to make siblings feel included and part of the team approach for the family in dealing with food allergies

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15



## How to Increase Coping Skills

- **Cope with underlying emotions**
  - Emotions and thoughts affect behavior
  - Learn ways to manage stress, anxiety, and anger

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16

# Coping with Underlying Emotions

## Anxiety

- Anxiety and fear are commonly associated emotional reactions to having a food allergy
- Having some anxiety is healthy and beneficial
  - Anxiety acts as a motivator in keeping the individual safe

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17

## Anxiety

- However, anxiety can build and detract significantly from overall quality of life
- Anxiety can cause:
  - Trouble sleeping/nightmares
  - Anxiety/panic attacks
  - Phobias
  - Problems with interpersonal relationships
  - Decreased school performance
  - Increased irritability

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18

# Anxiety

- Anticipatory anxiety
- Posttraumatic stress responses

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19

# Anticipatory Anxiety

The “What if??” Scenarios

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20

## Posttraumatic Stress

- Signs of Posttraumatic Stress Disorder
  - Experienced or witnessed death or serious injury AND person's response involved intense fear, helplessness, or horror
  - Persistent re-experiencing of the event
  - Persistent avoidance of stimuli associated with the event
  - Persistent symptoms of increased arousal
  - Significantly impacting social, occupational, or other areas of functioning

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21

## When to Seek Additional Help

- If you notice a pattern of maladaptive behavior or a pattern of symptoms that are negatively affecting your child
- If any one symptom is especially significant
- If your child tells you that he/she is experiencing significant anxiety or fear related to his/her food allergy

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22

## Where to Get Help

- Talk to your pediatrician
- Talk to your medical subspecialist
- Seek out mental health professionals in your area

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23

## Overall Goals

- Teaching and encouraging independence in maintaining an appropriate diet
- Empowering your child
- Fostering a sense of strong self-worth, self-efficacy, and well-being

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24

## References

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25

THANK YOU!

Questions?

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26

# Peanut Desensitization

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## What is desensitization?

- Induction of tolerance to a protein that once caused allergic reaction
  - Insect venoms (bees, wasps)
  - Pollens, molds, animal dander
  - Medications

## History of desensitization

- 1911: small dilutions of grass pollen injected subcutaneously until symptoms of hay fever better (and subjects eyes stopped reacting to pollen placed in them)
  - Allergy symptoms thought to be due to toxins from pollen and some patients were hypersensitive
- 1918: antibodies accepted as causative.
  - Treatments expanded to animal dander, foods

## History of Desensitization

- 1925: Prausnitz and Kustner transferred serum from fish allergic Kustner to Prausnitz and caused local reactions
- 1935: blood transfusion from “desensitized” patient could block reaction in allergic patient. Thought to be due to blocking antibodies
- 1950's: controlled studies showing efficacy for ragweed allergy, specific only to ragweed.

## History of Desensitization

- 1960's: Laboratory studies possible (blood outside of patients). Histamine release reduced in patients on desensitization programs
- 1970's: Insect venom immunotherapy found to be better than use of "whole body extract"
- 1980's and onward: further delineation of mechanisms, standardization of extracts, alternative forms of administration

## "Untoward Reactions"

- 1911: "it is possible...to induce a severe attack of hay fever lasting nearly 24 hrs..."
- 1962: patients with severe reactions to ragweed treatment had higher antibody levels than other patients
- 1957: U.K. data reported 26 deaths from 1911
- 1985: U.S. data reported 46 deaths from 1945

## But what does this have to do with peanuts?

- Lessons from aeroallergen immunotherapy:
  - Risk of reactions
    - Low but real, must be given in controlled setting with medical care available
  - 80% effective
    - But what about the other 20%?
  - Are all reactions to peanut the same?
    - No!

## What should be a goal?

- Allow children to eat peanut butter when they want?
- Prevent all reactions to ingestion?
- Minimize severity of reactions?
- Allow patients to become like Jimmie Carter?
- Treat all patients or only most severe?

## Peanut Allergy Shots

- 1997: 12 adults recruited, 6 in each arm of study (peanut or placebo)
  - Injection schedule: 5 day rapid build up phase, followed by weekly injections.
  - All injections done in special care unit with ICU physician in attendance
  - Patients then completed double blind placebo controlled challenges

## Peanut Allergy shots

- Upon oral challenges, all patients had reactions
  - Abdominal pain
  - Few with scattered hives
  - None with anaphylaxis
- 3 of 6 could not tolerate maintenance dose
  - "less protected than maintenance dose"
- Sounds great, sign us up!

## But wait...

- Of the 6 patients who underwent shots:
  - 76 reactions
  - 75 doses of epinephrine
  - 32 doses of albuterol
- Each patient had 7.7 anaphylactic reactions during treatment, and required 9.8 doses of epinephrine each.

## Well...now what?

- Tanox 901
  - Anti IgE molecule
    - Binds up circulating IgE, taking it out of the equation
    - Patients were able to tolerate increasing dose of peanut, but most reacted.
    - Increase was equivalent to 8 peanut kernels
      - Protective of accidental ingestion
    - Concern of risk taking behavior on study
      - Multiple reactions to other foods outside of study

## Xolair(omaluzimab)

- A different anti IgE molecule
- Due to patent/business issues Tanox 901 not taken to market
- Xolair, similar in concept
- Trial stopped early due to reactions:
  - 44% of Xolair patients (vs 20% of placebo) could tolerate increased dose.
  - Study stopped by external data monitoring committee
- Passive study ongoing in patients with asthma and food allergy

## Now what you've been waiting for....

- Blumchen et al, Berlin Germany 2008
  - Rush protocol (fast advancement dosing)
    - 6 patients from 3-10 years of age
    - 4/6 hives, 3/6 vomiting, 3/6 coughing during build up
    - Discharged home on daily peanut
- Burks et al, Duke and Arkansas Children's 2008
  - 13 children
  - All were able to tolerate 7.8 grams of peanut flour
    - 8 without any symptoms
    - 5 required benadryl
    - 2 had significant reactions during build up phase
    - But proved that immunologic mechanisms similar to IT

## The newest study

- Burks et al, Arkansas and Duke 2009
  - Different build up schedule
  - Slower overall than prior studies
  - Placebo patients could tolerate average dose of 460 mg (1 peanut)
  - IT patients could tolerate 5000 grams (15 peanuts)
  - 10 subjects (5 per group)

## What does this mean?

- Immunotherapy is not without risk
- Peanut reactions are more severe than other food allergies
- Concept of desensitization for foods has been proven
- Protocols need to be developed for safe build up
- Unclear how long this effect lasts
  - Studies on going to determine length of therapy