Myth Busters!
Using Evidence-Based Medicine to Dispel Your Patient’s Allergy-Related Urban Myths

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Disclosures

- Nothing to disclose
Objectives

- Discuss commonly held misconceptions in the field of Allergy/Immunology
- Analyze the evidence that refutes these commonly held misconceptions
- Describe information that can be utilized in clinical practice to address frequently asked questions received from referring providers and patients
Where Do Misperceptions Come From?

- Previously held beliefs from medical experts
  - Perpetuated through time
  - Many since refuted – extremely difficult to undue a wrong

- Public perception
  - Anecdotal reports
  - The “1 in a million” syndrome

- Widespread through internet, social media sources
  - 72% of internet users looked online for health information
  - 77% start with a search engine
  - If it’s on the internet, it must be true
  - No current regulation of any sort regarding content

Myth # 1

“I am allergic to anything that contains artificial dye”
Dye and Artificial Coloring - Background

- Artificial food coloring has been approved for use in the United States since 1906
- Food, Drug and Cosmetic Act (FD&C) currently regulates
- Controversy surrounding artificial food coloring has been circulating since 1950’s
- Dr. Feingold’s K-P diet gained popularity in 1970’s touting “Hyperkinesis” in children being caused by food additives
  - Many studies conducted
  - Most found no association
  - Almost all that support link had methodological flaws
- There is some support that a small subset of children with ADHD may improve by following an additive free diet
  
Dye and Artificial Coloring

- Artificial food additives have been implicated in chronic urticaria and asthma
  - Tartrazine (FD&C Yellow #5) most widely implicated/studied
  - No proven effect, many studies showing relationship had methodological flaws

- “Thus, there is no compelling evidence for the involvement of these colors in urticaria, angioedema, asthma, or atopic dermatitis”

Tartrazine: Yellow Dye #5

- 102 patients with history suspected reaction to tartrazine
- DBPCFC performed
  - 1 patient had reaction on day 5 of challenge

Red Dye Allergy

- PubMed search for “artificial red coloring (dye) and allergy” = 0 relevant articles
- Google search for “artificial red coloring and allergy” = 1,470,000 hits
  - Most websites discuss behavioral changes with food additives
- IgE mediated allergy (anaphylaxis)
  - No reports linked with artificial red coloring
  - Carmine = natural red coloring derived from dried bodies of female insect *Dactylopius coccus*
    - Widely used in cosmetics
    - Several case reports in literature describing IgE mediated reactions
    - Very rare in general population, especially pediatrics
Artificial Dye Allergy: Conclusions

- No scientific evidence to support a link between exposure to artificial coloring and IgE mediated allergic reactions
- Controversy exists regarding evidence for artificial coloring and behavioral changes in children
- There are no skin test extracts or serum specific IgE tests available to test for artificial dye allergy
- Stop the madness!
  - Dye free Benadryl???
Myth # 2
Egg allergy and vaccinations
Vaccines Prepared with Egg - Background

- Hen’s egg embryos used for enriched media to grow viruses used in the production of several vaccines
  - MMR, Rabies, Yellow Fever, and Influenza vaccines
- Typically involves use of chick embryonic fibroblast cell cultures or extra embryonic fluid
- Picograms or micrograms of egg protein may be introduced into the vaccines
- Vaccines can also contain several other ingredients that may provoke an IgE mediated reaction
  - Gelatin
  - Neomycin
Safety of MMR Vaccine in Egg Allergic Patients

Live, Attenuated Measles Vaccine
Its Administration to Children Allergic to Egg Protein

Peter B. Kamin, MD, Bernard T. Fein, MD, and Howard A. Britton, MD, San Antonio, Tex.

- JAMA 1963: First report demonstrating safety of measles vaccine to children with egg allergy
- NEJM 1985: Definitive studies showing safety of MMR administration in a single dose to egg allergic children

2013 Red Book:
Measles vaccine is produced in chicken embryo cell culture and does not contain significant amounts of egg white (ovalbumin) cross-reacting proteins. Children with egg allergy are at low risk of anaphylactic reactions to measles-containing vaccines (including MMR and MMRV).

Skin testing of children for egg allergy is not predictive of reactions to MMR vaccine and is not required before administering MMR or other measles-containing vaccines.
Safety of Influenza Vaccine in Egg Allergic Patients

- 2009 H1N1 influenza pandemic sparked renewed interest in investigating safety in egg allergic patients
- Since then, over 25 published trials or guidelines all demonstrating safety of influenza vaccine in children with egg allergy
- Safety in children with history of anaphylaxis to egg
- Flublok: recombinant vaccine approved for 2013-14 influenza season
  - No egg protein
  - No live virus

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2013 Recommendations

- General agreement regarding overall safety of influenza vaccine

- JCAAI:
  - Egg allergy is not a contraindication to administration of the influenza vaccine, regardless of history
  - Waiting periods are not warranted
  - Referral to an allergy specialist is not necessary

- CDC and AAP:
  - 30 minute observation for anyone with history of egg allergy
  - Referral to allergist for history of anaphylaxis to egg
Yellow Fever Vaccine and Safety in Egg Allergic Patients

- No clinical trials demonstrating safety
- Testing for a cutaneous response may be performed with the yellow fever vaccine, and the vaccine may be administered in a graded manner
- Another concern is the amount of gelatin present in this vaccine - 7500 μg per 0.5 mL of vaccine
- As with the rabies vaccine, the yellow fever vaccine requires evaluation for allergic reactions before administration in gelatin-hypersensitive patients

1. Chernin L et al. J Am Osteopath Assoc 2011;(111);10 suppl 6 S5-S6
Rabies Vaccine and Safety in Egg Allergic Patients

- No clinical trials demonstrating safety

- Alternative vaccines available without any egg:
  - Human diploid cell vaccine (HDCV)
  - Purified Vero cell rabies vaccine (PVRV)

- If unsure, patient can undergo skin prick testing to egg
  - If negative, can administer standard rabies vaccine via dose graded fashion

- It should be kept in mind that all rabies vaccine formulations may contain as much as 12,000 μg of gelatin per 1 mL of vaccine

- Thus, patients with a history of gelatin hypersensitivity should be evaluated by an allergist or immunologist before administration of this vaccine

1. Chernin L et al. J Am Osteopath Assoc 2011.(111);10 suppl 6 S5-S6
Egg Allergy and Vaccinations: Conclusions

- MMR is **safe for anyone with a history of egg allergy** – no testing or allergy referral required
- Influenza vaccine is safe to administer in standard fashion
  - Controversy regarding waiting period and allergy referral
  - Flublok (egg free) now available
- Rabies and Yellow Fever are contraindicated
  - Referral to allergist for testing or dose graded challenge
- Adverse reactions to vaccines occur but are not always due to immunologic mechanism
  - Other vaccine components can cause allergic reaction
Myth # 3
Shellfish, iodine, & radiocontrast media…oh, my
Contrast Media and Shellfish Allergy

- 2008 Survey of 231 physicians in six academic centers:
  - 2/3 of radiologists and 89% of cardiologists routinely ask patients about history of shellfish allergy before administering iodinated contrast media
  - 35% of radiologists and 50% of cardiologists would withhold contrast or pre-medicate if patients report a history of shellfish allergy

- Stupid question:
  - Why did the other 30% bother to ask?

Where Does this Come From?

- 1975 report by Shehadi\textsuperscript{1}:
  - Patients with a history of \textit{any allergy} = 2.2 x more likely to have reaction to contrast media
  - Number 1 allergy listed = seafood (15%)
  - Oh, by the way:
    - Other allergies listed, also at 15% include:
      - Egg
      - Milk
      - Chocolate
  - All allergies listed by self report, no confirmatory testing was ever performed

Shellfish and Iodine

- Origins of this association unclear
- Likely *created by physicians* linking history of shellfish allergy and iodinated contrast
- Iodine is not and cannot be an allergen
  - Present throughout all of our bodies
  - Present in table salt
- Fish and shellfish contain iodine, but this is not the source of allergens
  - Muscle proteins cause IgE mediated reactions
  - Tropomyosin and parvalbumin
Radiocontrast Media Reactions

- Various sources report reactions to high osmolality radiocontrast media between 5-12%.

- Vast majority of reactions are anaphylactoid (not caused by IgE) but are essentially identical to IgE mediated anaphylaxis:
  - Urticaria
  - Flushing
  - Angioedema
  - Hypotension
  - Bronchospasm

- Mechanism involves degranulation of mast cells through osmolar gradient.

- History of atopy increases risk of anaphylactoid reaction.
Premedication Regimen for Patients with a History of Prior Reaction to RCM

Routine Procedures:
- Prednisone 50 mg orally 13, 7, and 1 hour prior to procedure
  [In children: 0.5 to 0.7 mg/kg orally, up to 50 mg]
- Diphenhydramine 50 mg PO/IM/ or IV 1 hour prior to procedure
  [In children: 1.25 mg/kg orally, up to 50 mg]
- Lower / iso-osmolar RCM should be recommended
- Emergency therapy should be available

Emergency Procedures:
- Hydrocortisone, 200 mg IV, immediately and every four hours until completion of procedure and
- Diphenhydramine, 50 mg PO/IV (or IM), one hour before RCM administration and
- Use of the lowest osmolar RCM agent available
RCM, Shellfish and Iodine: Conclusions

- There is no physiologic or molecular connection between shellfish and radiocontrast media reactions
- Iodine has nothing to do with anything
- Radiocontrast media reactions with high osmolality agents are common
  - Patients with atopy are at elevated risk
  - Premedication regimens are very effective
- Stop the madness!
  - No indication to inquire about shellfish or iodine allergy in this setting
  - Absolutely no indication to withhold contrast in a patient who reports a history of shellfish or iodine allergy
Myth # 4

“This bloodwork will tell us what you/your child is allergic to”
Sensitization ≠ Allergy

- Sensitization
  - The detection of specific IgE toward an allergen through skin prick, intradermal, or serum specific IgE testing

- IgE mediated hypersensitivity
  - Characteristic clinical symptoms upon exposure to an allergen AND...
  - The detection of specific IgE toward that allergen
IgE Mediated Food Allergies

- Immediate hypersensitivity reactions to foods occur in 2-6% of children and 3-5% of adults
  - Cow’s milk, egg, soy, wheat, peanuts, tree nuts, fish, and shellfish account for > 90% of all food allergy

- Reactions are objective, immediate onset and reproducible with every exposure to the offending food, no matter what form

- Typical symptoms:
  - Urticaria, angioedema, emesis, rhinorrhea, wheezing, hypotension, anaphylaxis

- The best test to determine whether someone is allergic to a food is ingestion of that food

- Specific IgE testing is best utilized to confirm a suspicious history

- Delayed onset, non IgE mediated food intolerance cannot be confirmed with IgE testing
Serum Specific IgE Testing

- Levels of IgE specific for food and/or inhalant allergens can be obtained through routine venipuncture.
- Test offers convenience:
  - Do not need to stop antihistamines
  - Can test several allergens at once
  - Don’t need to undergo the dreaded skin testing
- Commercial panels widely available and marketed as excellent screening tools
- Results reported in a range from 0.1 kU/L – 100 kU/L:
  - Also reported as arbitrary classes (1 through 5)
  - A big “!” will accompany any value reported > 0.10 kU/L
Serum Specific IgE Testing

- 2010 Guidelines:

  4.2.2.4. Allergen-specific serum IgE.

  Guideline 7: The EP recommends sIgE tests for identifying foods that potentially provoke IgE-mediated food-induced allergic reactions, but alone these tests are not diagnostic of FA.

- Specific IgE tests for foods have a very high rate of false positive results
  - Often leads to misdiagnosis, unnecessary dietary elimination
  - Familial hardship, nutritional deficiencies

Rates of Sensitization > Clinical Allergy

- NHANES data reveal 28% of children & 15% of adults with specific IgE > 0.35 kU/L
- Clinical allergy rates 2-6%

Specific IgE Cutoff Points

- Values differ by food
- Values only established for select number of foods
- The level does not equate to the severity of reaction
  - In general, the higher the level, the more likely it has clinical relevance

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<th>Allergen</th>
<th>Decision point (kU_A/L)</th>
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<th>Specificity</th>
<th>Efficiency</th>
<th>PPV</th>
<th>NPV</th>
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<td>61</td>
<td>92</td>
<td>84</td>
<td>74</td>
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</table>

PPV, Positive predictive value; NPV, negative predictive value.

MY ALLERGY TEST

Find out what's causing your allergy symptoms in just 3 easy steps.

FIND THE CAUSE. DISCOVER RELIEF.
MyAllergyTest.net

"FIND THE CAUSE. DISCOVER RELIEF!"

How It Works  What We Do  What You Get  FAQs

WORRIED IT'S THE CAT? Find out for sure ... & know your options.

Now available at: Walmart  Walgreens  Meijer
Low, Low Price: $49.95

We test for 10 of the most common food, animal, environmental, and inhalant allergens.

- Egg
- Milk
- Wheat
- Mold (Alternaria)
- Dust Mite (pt)
- Bermuda Grass
- Timothy Grass
- Cedar
- Ragweed
- Cat

Now available at: Walmart, Walgreens, Meijer
Who should take the test?

Anyone with symptoms that may be related to allergies. Here are some of the common symptoms as well as some that you may not realize could be (but aren’t always) related to allergies.

**Common Symptoms**
- Stuffy, runny nose
- Itchy, watery eyes
- Sneezing
- Ear fullness & popping
- Hives

**Less Recognized Symptoms**
- Headaches, migraines
- Stomach aches
- Digestive issues
- Eczema
- Chronic ear infections
- Coughing, wheezing
- Seizures
- Burning, redness (mouth)
- Itchy Skin
A Quick Word About All the Other Stuff...

- Serum IgG antibodies towards foods touted by many practitioners as a tool to diagnose food allergy/intolerance

- IgG antibodies signify *exposure* to products—not *allergy*

- IgG may actually be a marker for food *tolerance*, not intolerance
  - Early recovery from cow’s milk allergy associated with increasing IgG₄¹

- “IgG and IgG subclass antibody tests for food allergy do not have clinical relevance, are not validated, lack sufficient quality control, and should not be performed”²

DOING EVERYTHING RIGHT BUT HAVE CONSTANT ACHES?

NEARLY 1 IN 3 PEOPLE SUFFER FROM A FOOD INTOLERANCE AND DON'T EVEN KNOW! A SINGLE FOOD OR INGREDIENT COULD BE KEEPING YOU FROM A HEALTHIER LIFESTYLE.

CRACK THE CODE TO YOUR WELLNESS TODAY

$45 REBATE

Getting your Children to Eat Healthy Food
Posted Aug 14, 2013

Quick and Healthy Dinners for your Family
Posted Aug 07, 2013

The Importance of Eating Breakfast
Posted Jul 31, 2013
• For the low, low price of $450, you can be ‘scanned’ for over 250 foods and additives

The HEMOCODE™ Food Intolerance System scans for sensitivities to 250 Foods and Additives

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<th>Grains</th>
<th>Seeds and Nuts</th>
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Serum Specific IgE Testing: Conclusions

- Not a reliable screening test
- Often leads to misinterpretation, diagnostic confusion, and unnecessary dietary elimination
- Can serve a purpose
  - Patient cannot stop antihistamines
  - Follow levels over time to help determine if tolerance to known food allergen has developed
- Large screening panels have little if any role
  - Obtain specific IgE levels only to those foods that are of concern
  - Use the history to help determine what food to investigate
- Be prepared for patients presenting with self diagnosis and/or use of alternative methods
Myth # 5

No milk ‘til 1 year…
No eggs ‘til 2 years…
And no nuts ‘til 3!!!

(And avoid eating anything while breastfeeding)
Food Introduction - Background

- 1960’s – most infants exposed to solids by 4 months of age
  - Average by 8 weeks!

- 1970’s – recommendations to delay until after 4 months
  - Sparked by rise in celiac disease

- 1990’s – experts recommend delayed introduction until after 6 months of age

- These trends predate rise in food allergies
  - Supported by rise in allergies
  - Actually may have contributed to rise in allergies!
2000 Recommendations from American Academy of Pediatrics

- Delay introduction of solid foods until 4-6 mos
- Use hypo-allergenic formula for at risk infants
- Introduce whole cow’s milk at 12 mos
- Avoid eggs until 2 years of age
- Avoid peanuts, tree nuts, fish until 3 years of age
- Mothers of at-risk infants should avoid consumption of peanuts during pregnancy and while breast feeding

(Based on few studies with various limitations)
Summary of 2008 AAP Recommendations

- Mom can eat whatever she wants during pregnancy and lactation – has no effect on prevention or development of allergies in newborn
- High risk infants: Breast feeding for 1st 4 months may decrease atopic dermatitis and milk allergy in 1st two years
- Breast feeding for 1st 3 months may decrease early wheeze but has no long term benefit
- High risk infants who are not breast fed: Use of extensively hydrolyzed formulas may delay onset of eczema
- No evidence to support delaying introduction of solid food past 4-6 months of age
  - Including fish, egg, milk, peanut

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<td>Define ‘high risk’</td>
<td>Parent or sibling with atopy</td>
<td>Both parents or 1 parent and sibling</td>
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<td>Avoidance of foods during pregnancy</td>
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</tr>
<tr>
<td>Exclusive breast feeding until</td>
<td>Evidence for 3-4 mos</td>
<td>6 months</td>
</tr>
<tr>
<td>Avoidance of foods during lactation</td>
<td>Some evidence for reduced atopic dermatitis</td>
<td>Peanuts, tree nuts and consider egg, milk, fish and “other foods”</td>
</tr>
<tr>
<td>Prevention formulas</td>
<td>Certain hydrosylates may delay onset compared with cow’s milk based, not soy</td>
<td>“Hypoallergenic” formulas, not soy</td>
</tr>
<tr>
<td>Types of solid foods</td>
<td>Evidence to wait until 4-6 mos; no evidence for specific foods</td>
<td>No solids until 6 mos, milk til 1 yr, egg til 2 yrs, peanuts, nuts, fish til 3 yrs</td>
</tr>
</tbody>
</table>
Food Introduction: Conclusions

- Significant changes in recommendations between 2000 and 2008
- No evidence to support avoidance of highly allergenic foods past 4-6 months of age
- New evidence emerging that early introduction of highly allergenic foods may promote tolerance
  - Current prospective trials
  - LEAP – early peanut introduction
  - EAT – early intro of 6 highly allergenic foods
  - Peanut consumption during pregnancy may reduce peanut allergy risk
Myth # 6

Skin testing is unreliable until 2 (or 3, or 5) years of age
Skin Testing and Age - Background

- Prick test first developed in 1924
- Used widely since 1970’s
- Introduction of allergen into epidermis
- If specific IgE towards the allergen is present on mast cells, then it will be cross linked
- Mast cell degranulation leads to immediate histamine release within 15 minutes
- Development of wheal (bump) and flare (erythema) consistent with the presence of specific IgE
  - Size predictive of clinical relevance, not severity
When Can Skin Testing Be Performed?
- Skin testing is reliable after 3 months of age
- Size of wheal decreases in very young and also after 50 years of age

Skin Testing and Age: Conclusions

- Based entirely on myth
- Skin testing is reliable at any age, and is an accurate way to assess for the presence of specific IgE
- Many young children will have negative skin test results...because allergies are not present
  - Nonallergic rhinitis
  - Non IgE mediated food allergy
  - Symptoms not consistent with allergies
- “If you’re old enough to have allergies, then you’re old enough to have a positive skin test to confirm that you have allergies”
Myth # 7

Penicillin allergy and safe antibiotic alternatives
Let’s Get Technical for a Second…

- True ‘allergic’ reactions to antibiotics are uncommon in the general population
- Adverse reactions after or while taking antibiotics are very common
  - Immunologic
    - Type I, II, III, IV
    - Not always predictable
    - Occurs in reproducible manner
  - Non-immunologic (idiosyncratic)
    - Unpredictable
    - Does not occur with every exposure
    - GI symptoms, cutaneous eruptions
What’s the Difference?

- Immunologic reactions to an antibiotic should preclude the re-administration of that particular antibiotic
  - IgE mediated immediate onset reactions could lead to anaphylaxis
  - Type III – serum sickness, erythema multiforme
  - Type IV – almost always delayed onset cutaneous rashes

- Allergy testing is only commercially available for IgE mediated reactions to penicillin and no other antibiotics

- Non-immunologic reactions should not be labeled as ‘allergy’ as they do not indicate a contraindication to re-administration
What’s the Big Deal?

- Penicillin allergy grossly overestimated in general population
- Less than 10% of patients reported to have penicillin allergy have positive skin test or symptoms upon challenge\(^1\)
- Misdiagnosis of drug allergy can lead to unnecessary avoidance
- Use of antibiotic alternatives
  - Inferior microbial sensitivity
  - Increased side effects/toxicity
  - Increased cost

How Can You Determine Allergy vs Side Effect?

- **History**
  - Timing of onset
  - Character of symptoms
  - Duration of symptoms
  - Have they received the drug again and if so, did they tolerate

- Can perform skin testing for penicillin
  - Pre-pen
  - Penicillin G
  - Negative skin prick and intradermal testing associated with 97-99% negative predictive value
Penicillin Cross Reactivity

- Beta lactam antibiotics all share common beta lactam ring
- This causes the minority of type I allergic reactions
- Cross reactivity comes from similarity in side chains

Rates of Cross Reactivity

- Penicillin + 1st & 2nd gen Cephalosporins = 4%
  - Share similar side chain w/Amoxicillin
- Penicillin + 3rd, 4th gen Cephalosporins = 0%
- Penicillin + Carbapenems = 8-50%\(^1,2\)
  - Recent literature show very little cross-reactivity
- Penicillin + Aztreonam = 0%

<table>
<thead>
<tr>
<th>Penicillin</th>
<th>Cephalosporins That Cross React</th>
<th>Common R1 Side Chain</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amoxicillin</td>
<td>Cefaclor†</td>
<td><img src="image" alt="Chemical Structure" /></td>
</tr>
<tr>
<td>Ampicillin</td>
<td>Cefadroxil*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cefatrizine*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cefprozil†</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cephalexin*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cephradine*</td>
<td></td>
</tr>
</tbody>
</table>
Treatment Options for IgE Mediated Drug Allergy

- Complete and strict avoidance of the offending drug
- Need to treat with structurally unrelated antibiotic alternatives
- If no equally efficacious alternatives exist, then desensitization can be considered
  - Procedure to rapidly produce a state of tolerance
  - Introduce gradually increasing amounts of dilute concentration over several hours
    - Start with 1:1,000 or 1:10,000 dilution
    - Often requires admission to ICU setting for constant monitoring
    - Upon completion, the drug must be taken consistently
      - Any lapse of > 24 hours and the desensitized state may be lost
Treatment Options for Non-IgE Mediated Drug Allergy

- Re-administration of the offending drug or structurally similar antibiotics is contraindicated
- Rates of cross-reactivity largely unknown
  - Utilize similar approach to IgE mediated reactions
- No commercially available testing reagents for non-IgE mediated drug reactions
- No effective desensitization protocols
Penicillin Cross Reactivity: Conclusions

- Less than 10% of people labeled as having penicillin allergy have an immunologic reaction
  - Avoidance of penicillin is unnecessary
  - Avoidance of cephalosporins is unnecessary

- For those with history concerning for immunologic reaction to penicillin:
  - Skin testing is available to aid in proper diagnosis
  - Will need to avoid penicillin until clarification of allergy status can be determined
  - Avoid 1st and limited 2nd generation cephalosporins as well as carbapenems
  - 3rd, 4th generation cephalosporins are completely safe
Myth # 8

“I have pet allergies, but it’s ok…we have a hypoallergenic cat/dog”
Pet Allergy - Background

- The United States has the highest percentage of household pets in the world – 62% with 1 or more domestic pets
- Cat and dog allergy has increased over past 6 decades
- Major cat (Fel d 1) and dog (Can f 1) allergens are released from:
  - Saliva, sebaceous glands, perianal glands
  - Allergen is harbored in
    - Skin particles/flakes
    - Fur
  - It’s not the hair that causes allergy!!!
Pet Allergens

- Fel d 1 (cat) and Can f 1 (dog) allergens
  - Ubiquitous throughout any home that has cats or dogs
    - Upholstered furniture, carpeting, ventilation system, clothing
  - Found in most public places
    - Schools, movie theaters, airplanes, hospitals
  - Only effective method to remove allergen is complete and strict removal of pet(s) from inside home
    - Even then, it can take 6 months before allergen is eliminated
Where Does a Hypoallergenic Pet Come From?

- Several companies market “hypoallergenic” pets
  - Most use false advertising referencing hair length, shedding, or pure fabrication

- Only 1 company has “world’s first scientifically proven hypoallergenic cat and dog”
  - Allerca Lifestyle Pets began operations in 2004
  - Initially $3,500 each per cat
  - Now $6,950 – 22,950 per cat and $15,950 per dog
  - Naturally breed select lineage that produce structurally mutated forms of Fel d 1 and Can f 1
  - Animals still produce minor allergens that cause clinical symptoms in sensitized individuals

LIFESTYLE PETS has produced the world's first scientifically-proven hypoallergenic cats and dogs. These pets allow some of the millions of people with feline or canine allergies to finally enjoy the love and companionship of a household pet without suffering from allergic symptoms.
ALISON Z

"...my hideously allergic husband and a guest who has a history of going into anaphylactic shock had no reaction around our Pikachu [ALLERGA GD hypoallergenic cat]."
ALLERCA LIFESTYLE PETS - PRICING

Prices for the three LIFESTYLE PETS hypoallergenic breeds currently available are as follows (to read more about each type of pet click on the "Hypoallergenic Pets" tab above):

ALLERCA GD CAT : US$6,950
(orders placed today Sunday, August 18, 2013 will be delivered in OCTOBER 2013)

ASHERA GD CAT : US$27,950

JABARI GD DOG : US$15,950

Please note that delivery to your nearest airport/country is an additional cost: in the U.S./Canada US$795, rest of the world US$1,750, Please contact us for availability/delivery on the ASHERA GD and JABARI GD.
Hypoallergenic Pets: Conclusions

- A true non-allergenic cat or dog does not exist
- Certain breeds may cause more symptoms for certain individuals with pet allergy
- The length of hair, shedding cycle, and breed of cat/dog has no effect on the amount of allergen that is secreted
- The only effective strategy to eliminate exposure is complete removal of the pet from inside the home
Myth # 9

“No thank you, I’ll pass on the muffins. I’m allergic to gluten”
What is Gluten, Anyway?

- Buddhist monks discovered gluten in the 7th century
  - The monks, who were vegetarians, were trying to find a substitute for meat
  - Discovered that when they submerged dough in water, the starch washed off and all that was left was a meat-like, textured, gummy mass - Gluten

- Protein found in wheat, barley, rye
  - Adds elasticity to dough, helping it rise
  - Adds shape
  - Allows for chewy texture
Gluten Sensitivity - Background

- Gluten free diets have become increasingly popular during past decade
- Many people self-label as having ‘gluten allergy’
  - Most without any true medical reason to avoid gluten
- IgE mediated hypersensitivity reactions can occur towards wheat, rye, barley but this is not due to gluten
- Google search “Gluten sensitivity” = 5,830,000 results
- Google search “Gluten free diet” = 23,300,000 results
@noahcyrus love u noie! U saw how much I ate today at Easter lunch but all of it was healthy and even more fulfilling! Health is happiness!

In reply to Noah Lindsey Cyrus

@RealFloydCyrus everyone should try no gluten for a week! The change in your skin, physical and mental health is amazing! U won't go back!

In reply to Floyd Cyrus

For everyone calling me anorexic I have a gluten and lactose allergy. It's not about weight it's about health. Gluten is crappppp anyway!
Celiac Disease

- Autoimmune condition, not IgE mediated hypersensitivity
- Genetic susceptibility: HLA-DQ2 haplotype (DQA1*0501/DQB1*0201) present in 90% of patients
  - 1/3 of general population
- IgA Autoantibodies formed towards tissue transglutaminase
- Can present at any age
  - Bloating
  - Weight loss
  - Diarrhea
  - Skin rash (dermatitis herpetiformis)
## Table 1. Serum Tests for the Diagnosis of Celiac Disease.

<table>
<thead>
<tr>
<th>Test</th>
<th>Sensitivity (Range)</th>
<th>Specificity (Range)</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>IgA anti-tTG antibodies</td>
<td>&gt;95.0 (73.9–100)</td>
<td>&gt;95.0 (77.8–100)</td>
<td>Recommended as first-level screening test</td>
</tr>
<tr>
<td>IgG anti-tTG antibodies</td>
<td>Widely variable (12.6–99.3)</td>
<td>Widely variable (86.3–100)</td>
<td>Useful in patients with IgA deficiency</td>
</tr>
<tr>
<td>IgA antiendomysial antibodies</td>
<td>&gt;90.0 (82.6–100)</td>
<td>98.2 (94.7–100)</td>
<td>Useful in patients with an uncertain diagnosis</td>
</tr>
<tr>
<td>IgG DGP</td>
<td>&gt;90.0 (80.1–98.6)</td>
<td>&gt;90.0 (86.0–96.9)</td>
<td>Useful in patients with IgA deficiency and young children</td>
</tr>
<tr>
<td>HLA-DQ2 or HLA-DQ8</td>
<td>91.0 (82.6–97.0)</td>
<td>54.0 (12.0–68.0)</td>
<td>High negative predictive value</td>
</tr>
</tbody>
</table>

* Data are from Husby et al.\(^{28}\) and Giersiepen et al.\(^{29}\) DGP denotes deamidated gliadin peptides, and tTG tissue transglutaminase.
Celiac Disease

- Diagnostic modalities
  - Serum testing for anti-TTG IgA is preferred screening test
    - Caution with IgA deficiency
  - Anti-endomysial IgA ~100% specific but use with caution
  - Endoscopy with small bowel biopsy
    - Increased intraepithelial lymphocytes
    - Crypt elongation
    - Partial or total villous atrophy

- Treatment
  - Gluten free diet
  - Improves symptoms
  - Results in intestinal repair
Non-Celiac Gluten Sensitivity

- Many patients report GI symptoms after ingestion of gluten containing foods but do not have evidence of celiac disease or IgE mediated hypersensitivity
- No biomarkers available
- Double blind placebo controlled challenge only diagnostic tool currently available
<table>
<thead>
<tr>
<th>Variable</th>
<th>Celiac Disease</th>
<th>Gluten Sensitivity</th>
<th>Wheat Allergy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interval between exposure</td>
<td>Weeks to years</td>
<td>Hours to days</td>
<td>Minutes to hours</td>
</tr>
<tr>
<td>to gluten and onset of symptoms</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pathogenesis</td>
<td>Autoimmunity (innate and adaptive immunity)</td>
<td>Possibly innate immunity</td>
<td>Allergic immune response</td>
</tr>
<tr>
<td>HLA</td>
<td>Restricted to HLA-DQ2 or HLA-DQ8 (in approximately 97% of positive cases)</td>
<td>Not restricted to HLA-DQ2 or HLA-DQ8 (HLA-DQ2-positive, HLA-DQ2-positive, or both in 50% of patients)</td>
<td></td>
</tr>
<tr>
<td>Autoantibodies</td>
<td>Almost always present</td>
<td>Always absent</td>
<td>Always absent</td>
</tr>
<tr>
<td>Enteropathy</td>
<td>Almost always present</td>
<td>Always absent (slight increase in the intraepithelial lymphocyte count)</td>
<td>Always absent (eosinophils in the lamina propria)</td>
</tr>
<tr>
<td>Symptoms</td>
<td>Both intestinal and extraintestinal; gastrointestinal symptoms not distinguishable from those of gluten sensitivity and wheat allergy</td>
<td>Both intestinal and extraintestinal; gastrointestinal symptoms not distinguishable from those of celiac disease and wheat allergy</td>
<td>Both intestinal and extraintestinal; gastrointestinal symptoms not distinguishable from those of celiac disease and gluten sensitivity symptoms</td>
</tr>
<tr>
<td>Complications</td>
<td>Coexisting conditions; long-term complications</td>
<td>Absence of coexisting conditions and long-term complications</td>
<td>Absence of coexisting conditions; short-term complications (including anaphylaxis)</td>
</tr>
</tbody>
</table>
Gluten and all the Other Stuff

- Ingestion of gluten has been associated with many other chronic conditions
  - Autism spectrum disorder
  - Acne
  - Constipation
  - Migraines
  - Eczema
  - Depression
Autism: Gluten and Casein

- The opioid-excess hypothesis of autism suggests that autism is the consequence of the incomplete breakdown and excessive absorption of peptides with opioid activity (derived from foods which contain gluten and casein), causing disruption to biochemical and neuroregulatory processes.

- Dietary intervention studies have demonstrated mixed results:
  - Significant flaws in methodology
  - Lack of consensus re: outcome measures.
Gluten Free Diets: What’s the Harm?

- Requires adoption of a completely wheat free diet
- Associated with deficiencies in several vitamins/minerals
- Significantly more expensive to choose gluten free options
- No benefit of adopting “Low gluten” or “weekday gluten free” diets
Gluten sensitivity: conclusions

- IgE mediated hypersensitivity to ‘gluten’ very uncommon
- Celiac disease is autoimmune condition that improves with gluten free diet
- Gluten sensitivity is a poorly defined condition with lack of validated practical diagnostic tools
- Gluten free diets are often followed but without medical reasoning
- Gluten is currently being blamed for the ails of humanity – be prepared to discuss with patients
Bonus Myth # 10

“I need you to test me for exposure to black mold”
“At the Mold Treatment Centers Of America we know that Mold Sickness is real. We understand that the right medical help for Mold Sickness is difficult to find, and that's why we're here.”
THE SYMPTOMS OF MOLD EXPOSURE

Mold Exposure and the Common Misdiagnoses

Mold Exposure is perhaps the single most misdiagnosed illness in the United States. There are an estimated 57 million people in the U.S. that have been suffering from a mold related illness and are misdiagnosed.

Level - I  Common Symptoms of Mold Exposure

The most commonly reported symptoms of short term Mold exposure:

- Sneezing
- Itching Skin
- Redness and skin irritation
- Watery Eyes
- Itching Eyes
- Headache
Level - II Advanced Symptoms of Mold Exposure

The following symptoms of Mold exposure have been reported generally as a result from persons being in a Mold contaminate environment on and off for an extended period of time. Symptoms are reported to have become more severe and longer lasting directly in proportion to the length of exposure time. Their reported symptoms are as follows:

- Constant Headaches
- Nose Bleeds
- Feelings of Constant Fatigue
- Breathing Disorders
- Coughing up Blood or Black looking Debris
- Nausea
- Diarrhea
- Vomiting
- Loss of Appetite
- Weight Loss
- Hair loss
- Skin Rashes
- Open Sores on the Skin
- Memory Loss "Short Term"
- Neurological & Nervous Disorders
- Sexual Dysfunction
- Swollen Glands in the Neck Area and under the Armpit
- Sudden Asthma Attacks or Breathing Disorders
- Ear Infections and Pain
- Chronic Sinus Infections
- Chronic Bronchitis
- Pain in the Joints and Muscles

While it seems Mold can cause many symptoms one must remember that there are thousands of species of Mold. Different species of Mold can have a wide variety of reactions within different people.
Level - III  Late Symptoms of Mold Exposure

The following Mold exposure symptoms are the most severe and are attributed to high levels of exposure:

- Blindness
- Brain Damage
- Memory Loss "Long term"
- Bleeding Lungs
- Cancer
- Death

Common Mold Exposure Misdiagnoses

Fibromyalgia

Doctors don't know what causes fibromyalgia. Current thinking centers around a theory called "Central Sensitization". This theory has to do with sensitivity to pain and brain signals. Other thoughts concerning the causation of fibromyalgia are:

Sleep disturbances, Injury, Infection, Abnormalities of the autonomic (sympathetic) nervous system and Changes in muscle metabolism.

The symptoms of Mold Exposure are the mirror images reflecting the symptoms of fibromyalgia. Many people misdiagnosed with fibromyalgia have found relief when treated for Mold Exposure.
Where Did the Hysteria Come From?

- Article “For Some Lawyers, Mold is Gold” written by a staff journalist for the American Bar Association in 2001:
  - “toxic troubles translate into millions of dollars”
  - While claims for asbestos are fading... “with mold, it’s naturally occurring and the supply is endless ... claims involving adult onset asthma or cognitive functions such as short-term memory loss can be lucrative”

Cahill SF. For some lawyers, mold is gold. Am Bar Assoc J. December 2001.
Background: Media and Mold

- December, 2011

“Brittany Murphy Died From Toxic Mold Says Her Mother”
More publicity:

- Ed McMahon sued his insurance company for $20 million in April 2002 for the death of his dog, allegedly due to exposure to mycotoxins of *Stachybotrys chartarum*
- Michael Jordan ordered renovation of his residence at the Ritz-Carlton in Washington, DC due to mold related problems

Why I Hate the Internet

- Google search on 3/5/07 for “toxic mold” yielded 1,380,000 links
  - 1/30/12 = 2,330,000 links
  - 1/1/14 = 4,390,000 links

- A few excerpts:
  - Moldinspector.com lists 100 “top mold health symptoms”
    - bleeding lungs
    - cancer
    - central nervous system effects
    - coughing & resulting sore lungs/chest from excessive coughing
    - coughing up blood
    - dandruff problems [chronic] that don't go away despite use of anti-dandruff shampoos
    - dermatitis and skin rashes
    - diarrhea
    - eye and vision problems
    - fatigue [chronic, excessive, or continued] and/or general malaise
    - feeling lost or “disconnected” from what’s happening around you
    - hives
    - irritability
    - learning difficulties or mental functioning problems or personality changes
    - memory loss or memory difficulties/Alzheimers-like symptoms
    - open skin sores and lacerations
    - runny nose (rhinitis), clear, thin, watery mucus from your nose may appear suddenly, or thick, green slime coming out of nose
    - seizures
    - sleep disorders
    - tremors [shaking]
Absence of scientific evidence for adverse health effects in occupational settings with extremely high ambient concentrations of fungi

Study of differences in air concentrations on farms with and without adverse health effects

- Avg exposure to 120,000,000 spores/m³ in healthy controls
- Levels associated with adverse health effects were 10 times greater
- Avg home has 68 to 2,307 spores/m³

Noncontroversial Human Diseases Caused by Molds

- Allergic
- Infectious
- Toxic
Stachybotrys Mycotoxins

Effects on experimental animal models

- Cytotoxicity
- Metabolic inhibition
- Hemolysis
- Plasmin effects
- Pulmonary effects
- Immunologic effects
- Cytokine effects
- Cholesterol effects
- Neurologic effects
Human Toxicity

- By ingestion (*Majority of cases*)
  - Mushroom poisoning
  - *Aflatoxin B* – peanuts, soybeans, and cassava
    “*never eat a green peanut*”
  - Alimentary toxic aleukia – Russians and Japanese ate grains contaminated with *Fusarium* and *Stachybotrys* in the 1940s

- By inhalation (*exceptionally rare*)
  - Mycotoxicosis is worldwide veterinary disease that affects large farm animals, typically after heavy rainfall; leads to hemorrhage in visceral organs
  - Pulmonary mycotoxicosis (occupational disease of farming)
    - Mycotoxin concentration unknown, but massive
    - $10^{5.10}$ spores/M$^3$
Human Toxicity

- By contact (one report)
  - Fingertip skin inflammation reported in 3 women who handled moldy hordiculture pots contaminated with black masses of *Stachybotrys conidia* and other fungi
  - Mycotoxin postulated as cause
  - No tests were performed to determine etiologic agent or mechanism
  - These pots released up to 7,500 spores/m$^3$ into the air but no respiratory or systemic disease was reported

What Happens When One of These Patients Ends up in Your Office?

- Attempt to identify patient as atopic vs. nonatopic
- Appropriate radiographic evaluation
- Supportive laboratory testing with immunoglobulins, screening tests (ESR, CBC, etc.), specific IgG/IgE to fungi
- Environmental assessment by professional:
  - Smell
  - Visualization
  - Sample collection for culture and analysis
- Consider environmental avoidance challenge
Environmental Assessment

- Visual inspection is most important
  - Extent of water damage and mold growth
  - Focus on HVAC system and overall dampness

- No widely accepted quantitative standards

- Any source of water incursion should be addressed immediately
  - Remove water and water damaged materials – use N-95 respirator!!!
  - Maintain indoor relative humidity < 60% to inhibit mold growth

- May require professional assessment and/or remediation depending upon extent of damage
Non-Validated Mold Testing

- Stachybotrys IgA serologic assay
- Candida IgA, IgM, IgG
  - Valuable for ‘mold overgrowth syndrome’
- Urine mycotoxins
- Visual contrast sensitivity test
  - Biotoxins cause deficits in visual fields

“Most tests are not covered by insurance”
“Negative result does not rule out exposure”
“Results are often not upheld in court of law”
“Treatment”

- Detoxification is mainstay of therapy
- Phone consultation $50/hr
- Four step process
  - 1. Detox - $124.79
  - 2. Antifungal - $145.10
  - 3. Healthy Oil - $152.19
  - 4. Enzyme Pack - $126.90
- Air purifier
  - Austin Air Healthmate 400
    - $539.00
    - Bedroom machine $765.00
Grand Total

- $1,137.98
- Free shipping
mold: conclusions

- Mold is ubiquitous in our environment, including inside our homes
- Mycotoxins rarely cause human disease unless ingested in large quantities
- Mold can result in real disease in susceptible persons
- Majority of conditions attributed to mold exposure are exaggerated with no scientific basis or supportive evidence
- Be prepared for when these patients come to your office
  - Know your approach and be straightforward regarding your stance
Allergy myths: conclusions

- Many pre-existing and commonly recognized beliefs regarding allergies are not based upon scientific evidence.
- Review of the relevant medical literature can help navigate some of these myths and provide improved care for our patients.
- Take time to review internet resources to become familiar with what our patients are reading before they seek medical attention.

Stop the madness!!!
Thank You