



Aeroallergens: Seasonality, Cross-Reactivity, Anticipatory Guidance and More

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Disclosure Information

- I have no financial relationships to disclose



Objectives

The audience will at the end of this lecture:

- Understand the seasonality of various aeroallergens
- Identify the cross-reactivity of various aeroallergens
- Instruct the patient on how to avoid aeroallergens and environmental triggers
- Instruct the patient on how to tell a cold from an aeroallergen allergy
- Be cognizant of special considerations related to aeroallergen management

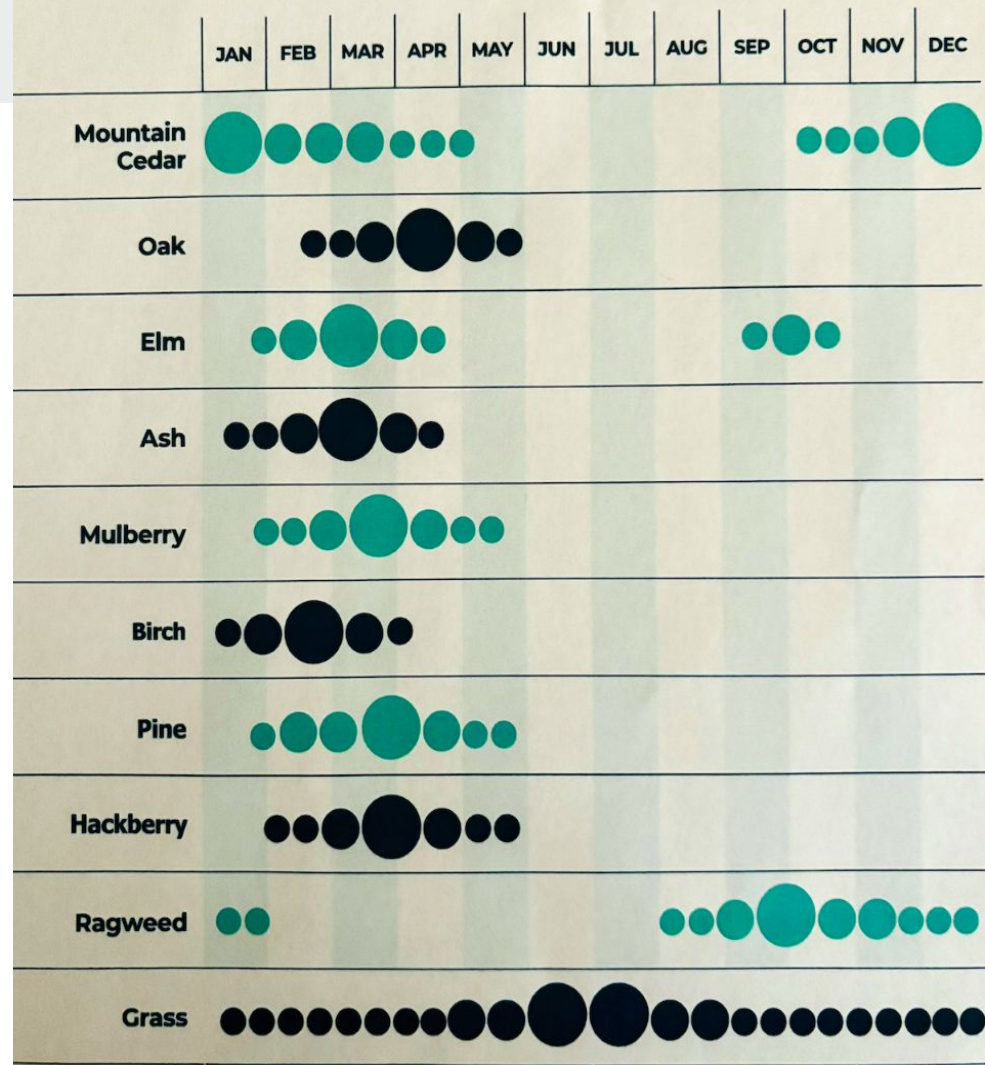


Seasonality of Aeroallergens

← SPRING SUMMER FALL WINTER →			
TREES GRASS DUST MITES PETS	WEEDS GRASS DUST MITES PETS	WEEDS RAGWEED MOLD DUST MITES PETS	MOLD DUST MITES PETS

Seasonality of Aeroallergens

- Seasonality in Texas
- Mold and Dust Mites can be present year-round



Cross-Reactivity - Texas

- Matching colors indicate cross-reactivity
- Box Elder also known as Maple
- Kentucky Blue also known as Meadow
- Minimum cross-reactivity suspicions between animals

Patient Name:		Patient ID:	
Date of Birth: / /		Testing Technician:	
Last use of antihistamine (or other medication affecting response to histamine):		Location: Back: <input type="radio"/>	Scale: Moderate 3-4 Severe 5-6
Days: Medication:		Arm: <input type="radio"/>	

	PANEL A					PANEL A				
	Site	Allergen	Epicutaneous W (mm)	Intradermal #2 #5	Endpoint	Site	Allergen	Epicutaneous W (mm)	Intradermal #2 #5	Endpoint
TREES	1	+ control				6	- Control			
	2	Green/Red Ash				7	American Elm			
	3	Box Elder				8	Pecan			
	4	M. Cedar				9	Mesquite			
	5	E. Cottonwood				10	Pine			
	PANEL B					PANEL B				
	Site	Allergen	Epicutaneous W (mm)	Intradermal #2 #5	Endpoint	Site	Allergen	Epicutaneous W (mm)	Intradermal #2 #5	Endpoint
	1	Water Oak				6	R. Mulberry			
	2	Live Oak				7	Hackberry			
	3	Am. Sycamore				8	W. Hickory			
	PANEL C					PANEL C				
	Site	Allergen	Epicutaneous W (mm)	Intradermal #2 #5	Endpoint	Site	Allergen	Epicutaneous W (mm)	Intradermal #2 #5	Endpoint
	1	Ragweed				6	Sagebrush			
	2	Marsh Elder				7	E. Plantain			
	3	Pigweed/Rough				8	Cocklebur			
WEEDS	PANEL D					PANEL D				
	Site	Allergen	Epicutaneous W (mm)	Intradermal #2 #5	Endpoint	Site	Allergen	Epicutaneous W (mm)	Intradermal #2 #5	Endpoint
	1	Curly Dock				6	Lamb's Quarters			
	2	B. Cypress				7	Dandelion			
	3	Nettle				8				
GRASSES	PANEL E					PANEL E				
	Site	Allergen	Epicutaneous W (mm)	Intradermal #2 #5	Endpoint	Site	Allergen	Epicutaneous W (mm)	Intradermal #2 #5	Endpoint
	1	Goldenrod				6	Cultivated Corn			
	2	Bermuda Grass				7	Cultivated Oat			
	3	Timothy Grass				8	Cultivated Wheat			
ANIMALS	PANEL F					PANEL F				
	Site	Allergen	Epicutaneous W (mm)	Intradermal #2 #5	Endpoint	Site	Allergen	Epicutaneous W (mm)	Intradermal #2 #5	Endpoint
	1	Kentucky Blue Grass				6	Cockroach			
	2	Rye				7	Fire Ant			
	3					8	Mouse			
MOLDS	PANEL G					PANEL G				
	Site	Allergen	Epicutaneous W (mm)	Intradermal #2 #5	Endpoint	Site	Allergen	Epicutaneous W (mm)	Intradermal #2 #5	Endpoint
	1	Bahia Grass				6	Rabbit			
	2	Johnson Grass				7	Mix Smut			
	3					8				
	PANEL H					PANEL H				
	Site	Allergen	Epicutaneous W (mm)	Intradermal #2 #5	Endpoint	Site	Allergen	Epicutaneous W (mm)	Intradermal #2 #5	Endpoint
	1	Fusarium				6	Bipolaris/Drechlera			
	2	Curvularia				7	Hormodendrum/Cladosporium			
	3	Mucor				8	Rhizopus			
	PANEL I					PANEL I				
	Site	Allergen	Epicutaneous W (mm)	Intradermal #2 #5	Endpoint	Site	Allergen	Epicutaneous W (mm)	Intradermal #2 #5	Endpoint
	1	Penicillium/Aureobasidium				6	Alternaria			
	2	Penicillium				7	Aspergillus			
	3					8				

Cross-Reactivity - Southwest

- Matching colors indicate cross-reactivity
- Minimum cross-reactivity suspicions between animals

Patient Name:		Patient ID:	
Date of Birth: / /		Testing Technician:	
Last use of antihistamine (or other medication affecting response to histamine):		Location: Back: <input type="radio"/>	Scale: Moderate 3-4 Severe 5-6
Days:	Medication:	Arm: <input type="radio"/>	

	PANEL A					PANEL A				
	Site	Allergen	Epicutaneous W (mm)	Intradermal #2 #5	Endpoint	Site	Allergen	Epicutaneous W (mm)	Intradermal #2 #5	Endpoint
TREES	1	+ control				6	- Control			
	2	White Ash				7	American Elm			
	3	Box Elder				8	White Alder			
	4	M. Cedar				9	Black Walnut			
	5	E. Cottonwood				10	White Pine			
	PANEL B					PANEL B				
	Site	Allergen	Epicutaneous W (mm)	Intradermal #2 #5	Endpoint	Site	Allergen	Epicutaneous W (mm)	Intradermal #2 #5	Endpoint
TREES	1	White Oak				6	R. Mulberry			
	2	Privet				7	Hackberry			
	3	Am. Sycamore				8	Acacia			
	4	River Birch				9	Black Willow			
	5	Poplar				10	Western Juniper			
	PANEL C					PANEL C				
	Site	Allergen	Epicutaneous W (mm)	Intradermal #2 #5	Endpoint	Site	Allergen	Epicutaneous W (mm)	Intradermal #2 #5	Endpoint
WEEDS	1	Dock/Sorrel Mix				6	Sagebrush			
	2	Marsh Elder				7	E. Plantain			
	3	Pigweed				8	Cocklebur			
	4	Careless				9	Lamb's Quarters			
	5	Dog Fennel				10	Russian Thistle			
	PANEL D					PANEL D				
	Site	Allergen	Epicutaneous W (mm)	Intradermal #2 #5	Endpoint	Site	Allergen	Epicutaneous W (mm)	Intradermal #2 #5	Endpoint
GRASSES		Saltbush				6	Alfalfa			
		Kochia				7	Rye			
		Kentucky (June)				8	Orchard			
		Bermuda Grass				9	Smooth Brome			
		Timothy Grass				10	Johnson Grass			
	PANEL E					PANEL E				
	Site	Allergen	Epicutaneous W (mm)	Intradermal #2 #5	Endpoint	Site	Allergen	Epicutaneous W (mm)	Intradermal #2 #5	Endpoint
MIX	1	Mesquite				6	Dog			
	2	Palo Verde				7	Cat			
	3	Ragweed, giant				8	Cattle			
	4	Ragweed, short				9	Horse			
	5	Mite Mix				10	Cockroach Mix			
	PANEL F					PANEL F				
	Site	Allergen	Epicutaneous W (mm)	Intradermal #2 #5	Endpoint	Site	Allergen	Epicutaneous W (mm)	Intradermal #2 #5	Endpoint
MOLDS	1	Fusarium				6	Bipolaris (Helmith)			
	2	Epicoccum				7	Hormodend./Cladosp.			
	3	Mucor				8	Rhizopus			
	4	Pullaria				9	Alternaria			
	5	Penicillium				10	Aspergillus			

Cross-Reactivity - Colorado

- Matching colors indicate cross-reactivity
- Minimum cross-reactivity suspicions between animals

Patient Name:		Patient ID:	
Date of Birth: / /		Testing Technician:	
Last use of antihistamine (or other medication affecting response to histamine):		Location: Back: <input type="radio"/>	Scale: Moderate 3-4 Severe 5-6
Days: Medication:		Arm: <input type="radio"/>	

TREES	PANEL A					PANEL A				
	Site	Allergen	Epicutaneous W (mm)	Intradermal #2 #5	Endpoint	Site	Allergen	Epicutaneous W (mm)	Intradermal #2 #5	Endpoint
	1	+ control				6	- Control			
	2	White Ash				7	American Elm			
	3	Box Elder				8	White Alder			
WEEDS	PANEL B					PANEL B				
	Site	Allergen	Epicutaneous W (mm)	Intradermal #2 #5	Endpoint	Site	Allergen	Epicutaneous W (mm)	Intradermal #2 #5	Endpoint
	1	White Oak				6	R. Mulberry			
	2	Privet				7	Hackberry			
	3	Am. Sycamore				8	Acacia			
GRASSES	PANEL C					PANEL C				
	Site	Allergen	Epicutaneous W (mm)	Intradermal #2 #5	Endpoint	Site	Allergen	Epicutaneous W (mm)	Intradermal #2 #5	Endpoint
	1	Ragweed				6	Sagebrush			
	2	Marsh Elder				7	E. Plantain			
	3	Pigweed/Rough				8	Cocklebur			
ANIMALS	PANEL D					PANEL D				
	Site	Allergen	Epicutaneous W (mm)	Intradermal #2 #5	Endpoint	Site	Allergen	Epicutaneous W (mm)	Intradermal #2 #5	Endpoint
	1	Saltbush				6	Kentucky (Junc)			
	2	Kochia				7	Rye			
	3	Meadow Fescue				8	Orchard			
MOLDS	PANEL E					PANEL E				
	Site	Allergen	Epicutaneous W (mm)	Intradermal #2 #5	Endpoint	Site	Allergen	Epicutaneous W (mm)	Intradermal #2 #5	Endpoint
	1	Feather Mix				6	Cockroach			
	2	Cattle				7	Mite Mix			
	3	Horse				8	Mouse			
	PANEL F					PANEL F				
	Site	Allergen	Epicutaneous W (mm)	Intradermal #2 #5	Endpoint	Site	Allergen	Epicutaneous W (mm)	Intradermal #2 #5	Endpoint
	1	Fusarium				6	Bipolaris (Helmith)			
	2	Epicoccum				7	Hormodend./Cladosp.			
	3	Mucor				8	Rhizopus			
	PANEL G					PANEL G				
	Site	Allergen	Epicutaneous W (mm)	Intradermal #2 #5	Endpoint	Site	Allergen	Epicutaneous W (mm)	Intradermal #2 #5	Endpoint
	1	Penicillium				6	Aspergillus			
	2	Aspergillus				7	Penicillium			
	3	Cladophora				8	Cladophora			

Cross-Reactivity - Florida

- Matching colors indicate cross-reactivity
- Minimum cross-reactivity suspicions between animals

Patient Name:		Patient ID:	
Date of Birth: / /		Testing Technician:	
Last use of antihistamine (or other medication affecting response to histamine):		Location: Back: <input type="radio"/>	Scale: Moderate 3-4 Severe 5-6
Days: Medication:		Arm: <input type="radio"/>	

	PANEL A					PANEL A				
	Site	Allergen	W (mm)	#2	#5	Site	Allergen	W (mm)	#2	#5
TREES	1	+ Control				6	- Control			
	2	White Ash				7	American Elm			
	3	Box Elder				8	Pecan			
	4	M. Cedar				9	White Alder			
	5	E. Cottonwood				10	White Pine			
	PANEL B					PANEL B				
	Site	Allergen	W (mm)	#2	#5	Site	Allergen	W (mm)	#2	#5
TREES	1	Live Oak				6	R. Mulberry			
	2	Privet				7	Hackberry			
	3	Am. Sycamore				8	W. Hickory			
	4	R. River Birch				9	Black Willow			
	5	B. Cypress				10	Australian Pine			
	PANEL C					PANEL C				
	Site	Allergen	W (mm)	#2	#5	Site	Allergen	W (mm)	#2	#5
TREES / GRASS	1	Pepper Tree				6	Bahia			
	2	Queen Palm				7	Johnson			
	3	Bayberry				8	Bermuda			
	4	Melaleuca				9	Rye			
	5	Sweetgum				10	Timothy			
	PANEL D					PANEL D				
	Site	Allergen	W (mm)	#2	#5	Site	Allergen	W (mm)	#2	#5
WEEDS	1	Ragweed				6	Sagebrush			
	2	Marsh Elder				7	Orchard			
	3	Pigweed				8	Cocklebur			
	4	Dock/Sorrel Mix				9	Lamb's Quarters			
	5	Nettle				10	Dog Fennel			
	PANEL E					PANEL E				
	Site	Allergen	W (mm)	#2	#5	Site	Allergen	W (mm)	#2	#5
ANIMALS	1	Feather				6	Cockroach			
	2	Cattle				7	Mite Mix			
	3	Horse				8	Mouse			
	4	Dog				9	Rabbit			
	5	Cat				10	Mix Smut			
	PANEL F					PANEL F				
	Site	Allergen	W (mm)	#2	#5	Site	Allergen	W (mm)	#2	#5
MOLDS	1	Fusarium				6	Bipolaris (Helmith)			
	2	Epicoccum				7	Hormodon/Cladosp.			
	3	Mucor				8	Rhizopus			
	4	Pullaria				9	Alternaria			
	5	Penicillium				10	Aspergillus			



Cross-Reactivity - Oral Allergy Syndrome

Pollen	Food
Birch Tree	Pitted Fruits (apricot, cherry, peach, plum), apple, pear, kiwi, carrot, celery, parsley, peanut, soybean, almond, hazelnut
American Elm Tree	Peach and melons
Timothy & Orchard Grass	Peach, watermelon, orange, tomato, white potato
Ragweed	Melons (cantaloupe, honeydew, watermelon), banana, cucumber, white potato, zucchini
Mugwort weed	Bell pepper, broccoli, cabbage, cauliflower, chard, garlic, onion, parsley



Anticipatory Guidance - Dust Mites

- Enclose your mattress and boxsprings in a zippered dust-proof encasing, which will keep the dust mites inside the casing and away from you. Place a cloth tape over the encasing zipper for best results
- Wash all bedding in hot 130F water weekly
- Put pillows in zippered dust proof encasings and/or wash the pillows every week with your bedding
- Do not lie on upholstered furniture or carpet
- If you have carpet, consider removing/replacing it with washable area rugs
- Use wood, leather or vinyl furniture instead of upholstered furniture in the bedroom



Anticipatory Guidance - Dust Mites

- Make sure rugs and carpets are vacuumed frequently. The person with the dust mite allergy should not vacuum or be in the room while it is being vacuumed
- Keep the indoor moisture low, ideally at 30-40% level. In warm climates, an air conditioner or dehumidifier will keep humidity low
- Try not to use humidifiers and vaporizers, because they create a friendly environment for dust mites. If you must use a humidifier, clean it daily to prevent mold growth
- Chemical solutions can be helpful. Acaricides is a chemical that kills dust mites and can be applied regularly to carpeting or upholstered furniture although it will not remove existing mite droppings
- A tannic acid solution, applied as directed, can help neutralize the allergen in mite droppings



Anticipatory Guidance - Molds

- Indoor molds are found in dark, warm, humid and musty environments
 - Damp basements, cellars, attics, bathrooms, and laundry rooms
- Indoor molds are found where fresh food is stored
 - Refrigerator drip trays, garbage pails, air conditioners and humidifiers
- Indoor molds examples
 - *Aspergillus fumigatus*
 - *Penicillium citrinum*
- Outdoor molds grow in moist shady areas
 - Soil, decaying vegetation, compost piles, rotting wood, fallen trees
- Outdoor molds examples
 - *Alternaria alternata*
 - *Cladosporium*



Anticipatory Guidance - Molds

- Use a dehumidifier or air conditioner to maintain relative humidity below 50% and keep temperatures cool
- Vent bathrooms and clothes dryer to the outside
- Run bathroom and kitchen vents while bathing and cooking
- Regularly check faucets, pipes, to-go flasks and ductwork for leaks
- When first turning on home or car air conditioners, leave the room or drive with the windows open for several minutes to allow mold spores to disperse
- Remove decaying debris from the yard, roof and gutters
- Avoid raking leaves, mowing lawns or working with peat, mulch, hay or dead wood
 - If you do have to yard work, wear a mask and avoid hot/humid days




Anticipatory Guidance - Pets

- Avoidance or keep pet with immunotherapy and below environmental adjustments
- Keep pets out of bedrooms. Given the amount of time spent in bed, it is helpful to keep that room clear of allergens. Cats and dogs may be fond of spending their day curled up on the bed but can lead to issues at nighttime
- Keep pets off of upholstered furniture
- If your home has air ducts, have them cleaned regularly to remove accumulated animal dander and dust
- Have the pet washed regularly by a non-allergic person



Anticipatory Guidance - Pets

- Consider purchasing a HEPA air cleaner to remove dander from the air
- Choose linens made of synthetic material over down-filled comforters and pillows
- The feather stuffing used in down pillows and comforters can also be a source of pet dander (bird dander)
- Vacuum floors and furniture regularly with a vacuum that contains a HEPA filter



Anticipatory Guidance - Cold vs. Pollen Allergy

Cold	Allergy
Stuffy or runny nose	Stuffy or runny nose
Sneezing	Sneezing
RARELY itchy, watery, or red eyes	Itchy, watery, or red eyes
RARELY duration >10 days	Duration >10 days
Sore throat	+/- Sore throat
+/- Dark circles under eyes	Dark circles under eyes
Cough	+/- Cough
+/- General aches and pains	NO General aches and pains
+/- Fever	NO Fever



Special Considerations - Aeroallergens Management

- Pregnancy
 - Allergic Rhinitis symptoms increase in $\frac{1}{3}$ of pregnant patients
 - 1st and 2nd generation antihistamines can be used
 - Intranasal steroids/antihistamines and Sodium Cromolyn can be used
 - +/- Montelukast
 - Avoid oral decongestants
 - Immunotherapy may be continued without dose escalation but not initiated during pregnancy



Special Considerations - Aeroallergens Management

- Elderly Patients
 - Rhinitis can be affected by age-related cholinergic hypersensitivity, anatomic changes or concomitant medication use
 - Allergic Rhinitis is not a common cause of new-onset rhinitis in >65 year olds
 - Gustatory Rhinitis is more common
 - Intranasal steroids and Ipratropium can be used
 - Non-sedating antihistamines > Sedating antihistamines
 - Least sedating: Fexofenadine, Cetirizine, Levocetirizine, Loratadine
 - Sedating: Diphenhydramine, Hydroxyzine, Promethazine



Special Considerations - Aeroallergens Management

- Athletes
 - Avoid prescribing medications on the list of doping agents
 - Avoid Pseudoephedrine and oral Glucocorticoids (Most inhalers are allowed)
 - Performance can be affected by chronic or rebound nasal congestion



Special Considerations - Aeroallergens Management

- Air Pollution (WHO Risk Factor for Allergy and/or Asthma)
 - Mixture of particles and gases emitted directly in the atmosphere or generated by chemical reactions
 - Human activities and climate change are major components
 - Wildfires, dust storms
 - Oil refineries, chemical plants
 - Transportation
 - Gas appliances, wood burning
 - Tobacco
 - Agriculture use (deforestation and livestock)



Special Considerations - Aeroallergens Management

- Air Pollution
 - Increased incidence of aeroallergen sensitization (allergic rhinitis), atopic dermatitis, and asthma as early as 1 year of age
 - Air pollutants interact with aeroallergens increasing atopic sensitization
 - Induce IgE response (allergenicity)
 - Anticipatory guidance + close-fitting N-95 masks
 - Driving with windows closed and maintaining car filtration systems



Special Considerations - Aeroallergens Management

- Contraindications to Allergen Immunotherapy
 - Uncontrolled Asthma
 - Significantly reduced or compromised lung function
 - Failure of a major organ system
 - Unstable Angina or recent Myocardial Infarction
 - Significant Arrhythmia
 - Uncontrolled Hypertension
 - Beta Blocker Use +/- ACE inhibitor use



Resources for Patients & Providers

- National Institute of Environmental Sciences (<https://www.niehs.nih.gov/health>)
- American College of Allergy, Asthma, and Immunology [ACAAI]
(<https://acaai.org/allergies/allergic-conditions/>)
- American Academy of Allergy, Asthma, and Immunology [AAAAI]
(<https://www.aaaai.org/tools-for-the-public>)
- Greer Interactive Pollen Allergy Map (<https://www.stagrallergymap.com/>)
- ThermoFisher Scientific
(<https://www.thermofisher.com/phadia/us/en/resources/allergen-encyclopedia.html>)