

Wintertime Allergies and Asthma

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Objectives

1. Describe common winter allergens that can induce allergy symptoms during the colder months.
2. Discuss strategies to mitigate allergy related symptoms in at-risk populations during the winter season.
3. Identify risk factors contributing to asthma flares in the wintertime.

AEROALLERGEN

An airborne substance that induces an allergic reaction



Symptoms of Aeroallergens

Nose

- Nasal drainage
- Nasal congestion
- Nasal itching
- Sneezing



Eyes

- Eye itching
- Eye drainage
- Mild eye swelling



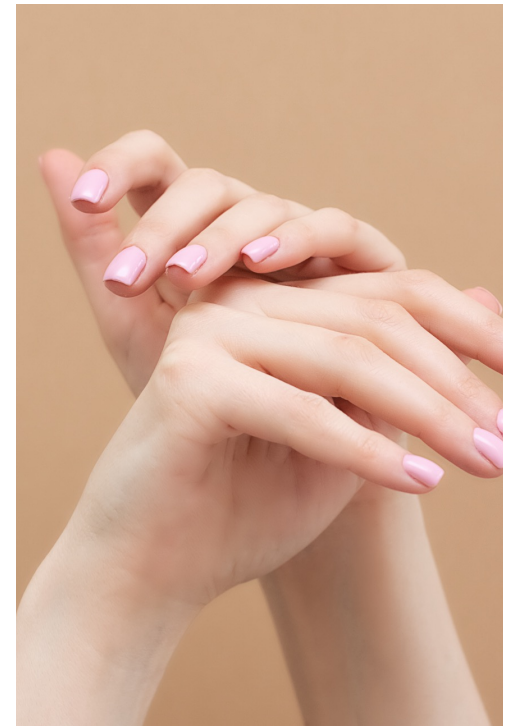
Lungs

- Cough
- Flares of asthma



Skin

- Flares of eczema



Major Aeroallergen Groups

Indoor

Dust mites

Fur-bearing animals

Insects

Indoor molds

Outdoor

Tree pollen

Grass pollen

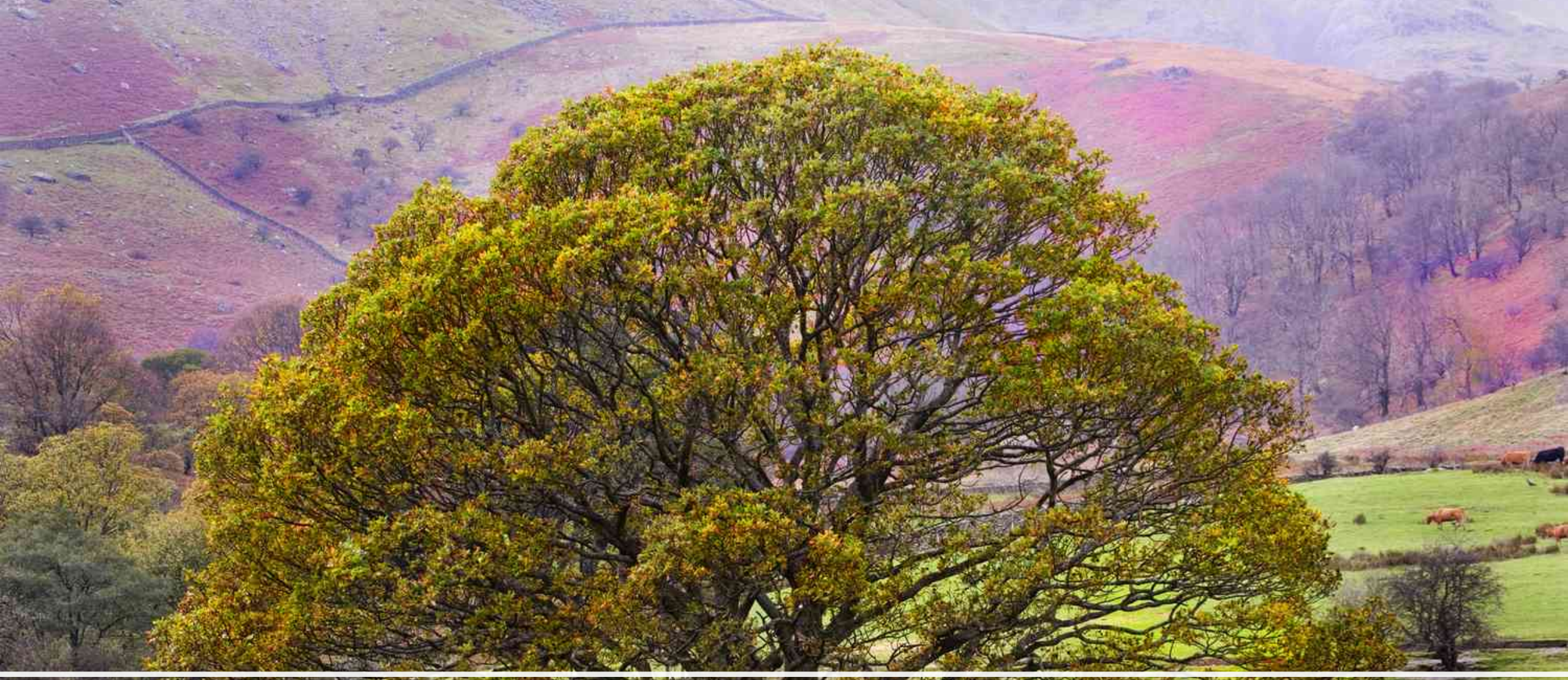
Weed pollen

Outdoor molds

Winter Allergens

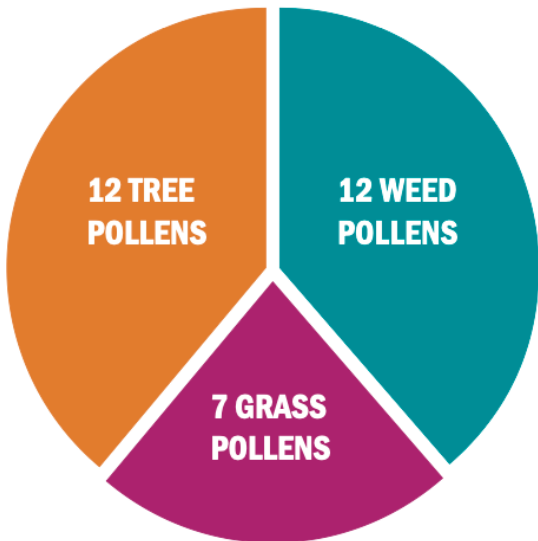
- Indoor allergens
 - Dust mites
 - Animals/pets
 - Insects
 - Indoor molds
- Outdoor allergens
 - Surprisingly, tree pollen!





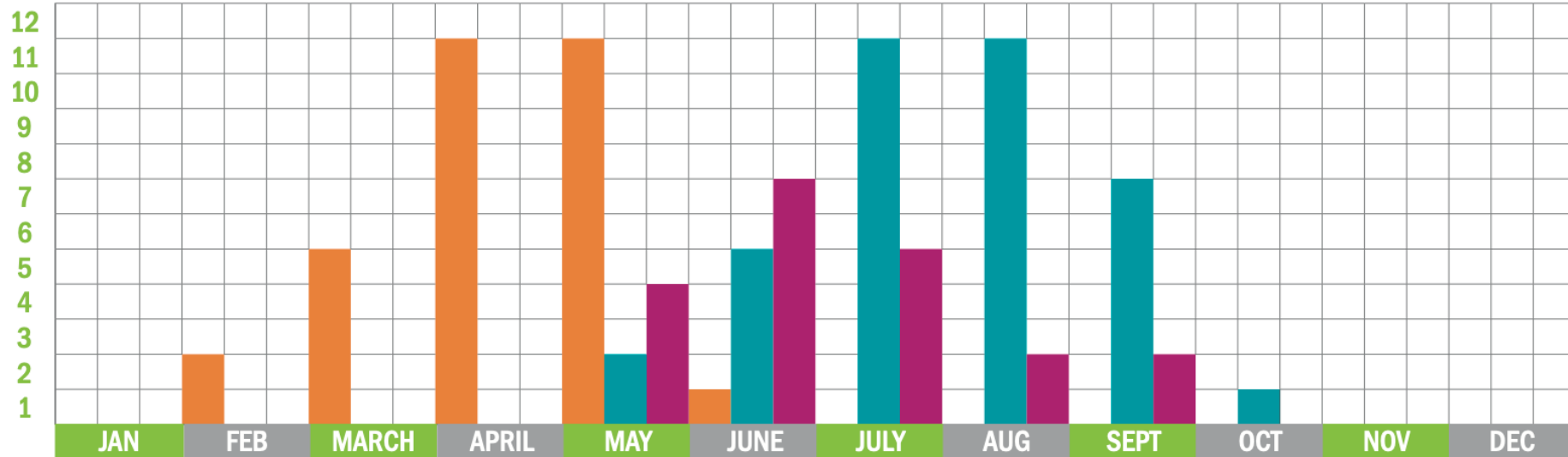
Tree Pollen





Number of seasonal allergens prominent in the Midwest by type.

Number of seasonal allergens prominent in the Midwest by type and month.



“Cedar Fever”



- Not actually a fever!
- Refers to allergy symptoms related to red cedar (juniper) pollen
- Can start pollinating in Jan/Feb in states of Texas, Oklahoma, Missouri
- Pollen can blow for many miles, and affect Nebraska populations



Mitigation for Pollen Allergy

No need to cut down your trees!

Environmental Controls

- Keep windows/doors closed during pollen season
- Change clothes/bathe after extended outdoor exposure
- Consider HEPA filters

Medications

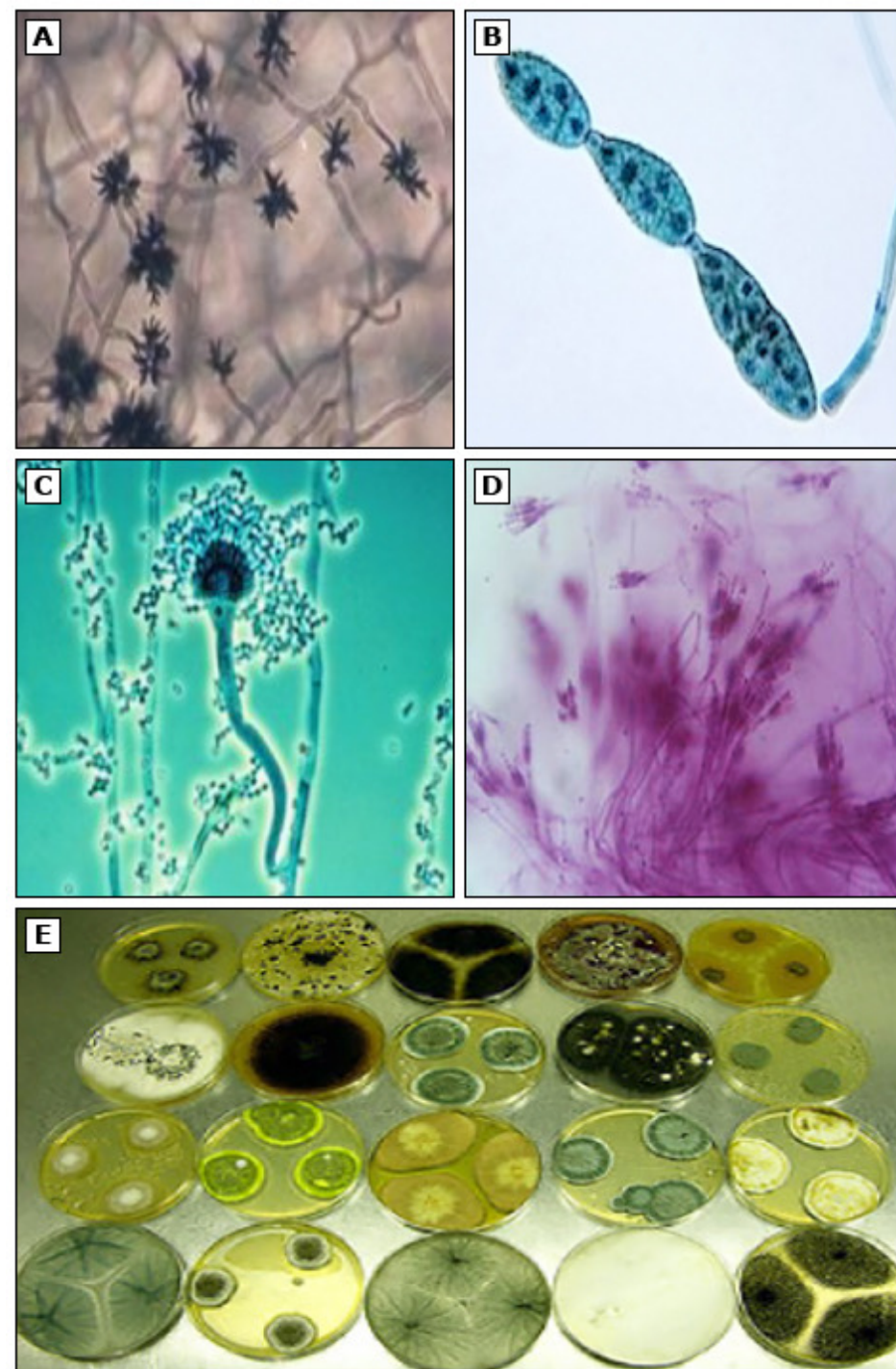
- Anti-histamines
- Nasal sprays
- Anti-leukotrienes (prescription)

Allergy Immunotherapy (shots)

- Help desensitize to allergies
- Not “steroid shots”
- Contain allergens

MOLDS

- Fungi
 - Reproduce from spores
 - Include yeasts, molds, mushrooms
- Mold = a type of fungus
 - Mildew: generic term for mold



MOLDS

Indoor

Penicillium
Rhizopus
Mucor
Aureobasidium

Indoor and Outdoor

Cladosporium
Aspergillus

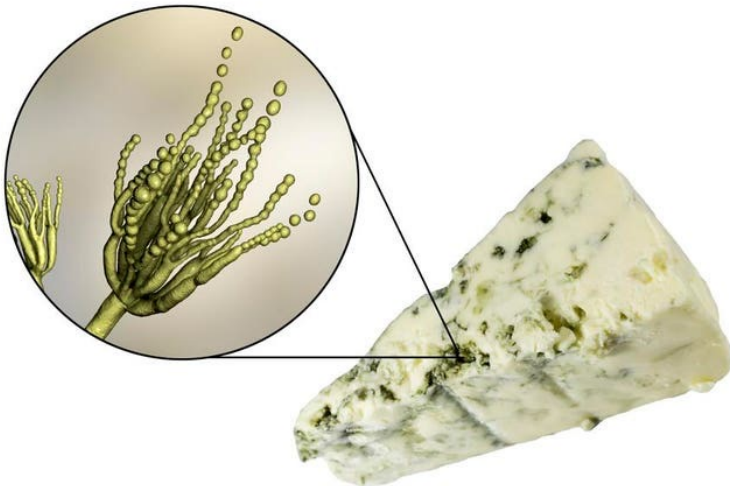
Outdoor

Alternaria
Curvularia
Dreschlera
Helminthosporium
Bipolaris
Grain smut
Epicoccum
Fusarium
Ascospores

INDOOR MOLDS

- **Penicillium**

- Food spoilage
- Cheese workers' lung: rare lung disease related to moldy cheese



- **Mucor and Rhizopus**

- Damp surfaces (kitchens and bathrooms)
- Leaf litter, decaying vegetation



- **Aureobasidium**

- Damp surfaces (kitchens and bathrooms)
- Colonizes paper and lumber



INDOOR MOLDS

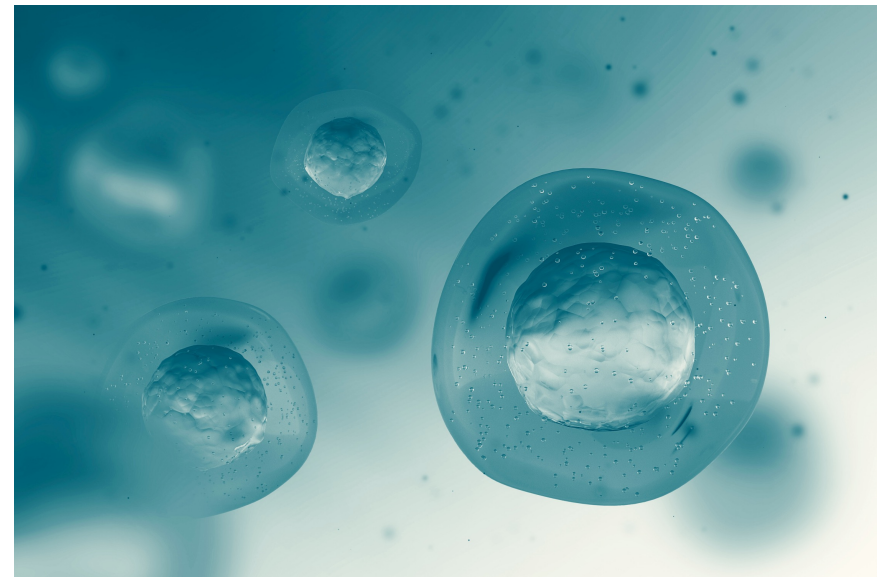
- **Cladosporium**

- Plant matter
- Damp surfaces (kitchens and bathrooms)

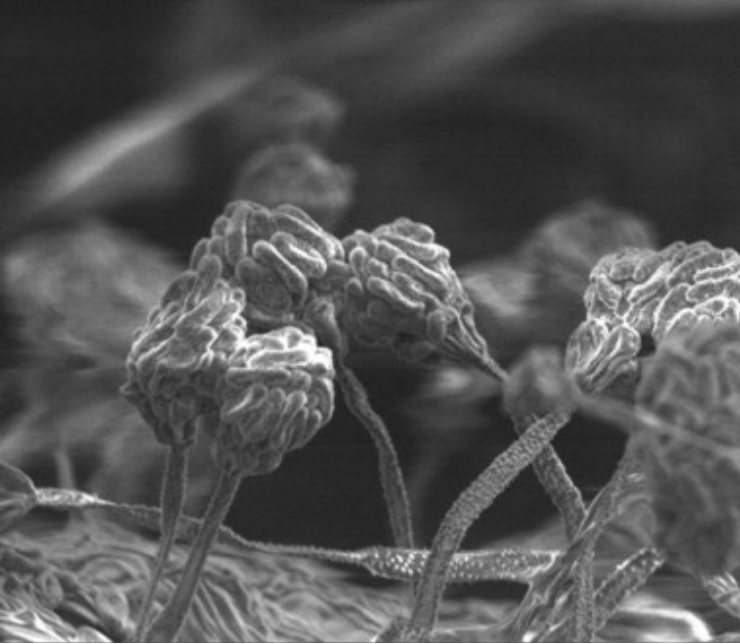


- **Aspergillus**

- Food spoilage
- Plant matter
- Usually benign except in immunocompromised







BLACK MOLD - STACHYBOTRYS

- Mycotoxin producing mold
- Damp wallpaper/particle board
- Media coverage

BLACK MOLD - STACHYBOTRYS

- 1930s – Ukrainian horses → bleeding and organ damage, linked to stachybotrys contaminated fodder
- 1993 – cluster of infantile lung damage cases in Cleveland



Chang C, Gershwin ME. The Myth of Mycotoxins and Mold Injury. *Clin Rev Allergy Immunol.* 2019;57(3):449-455. doi:10.1007/s12016-019-08767-4
Cogen FC. Stachybotrys-related allergy. *Ann Allergy Asthma Immunol.* 2004;92(2):285. doi:10.1016/S1081-1206(10)61563-3
Allergen of the Month—*Stachybotrys chartarum*
Weber, Richard W. *Annals of Allergy, Asthma & Immunology*, Volume 108, Issue 6, A9

“Sick Building Syndrome”/“Toxic Mold Syndrome”

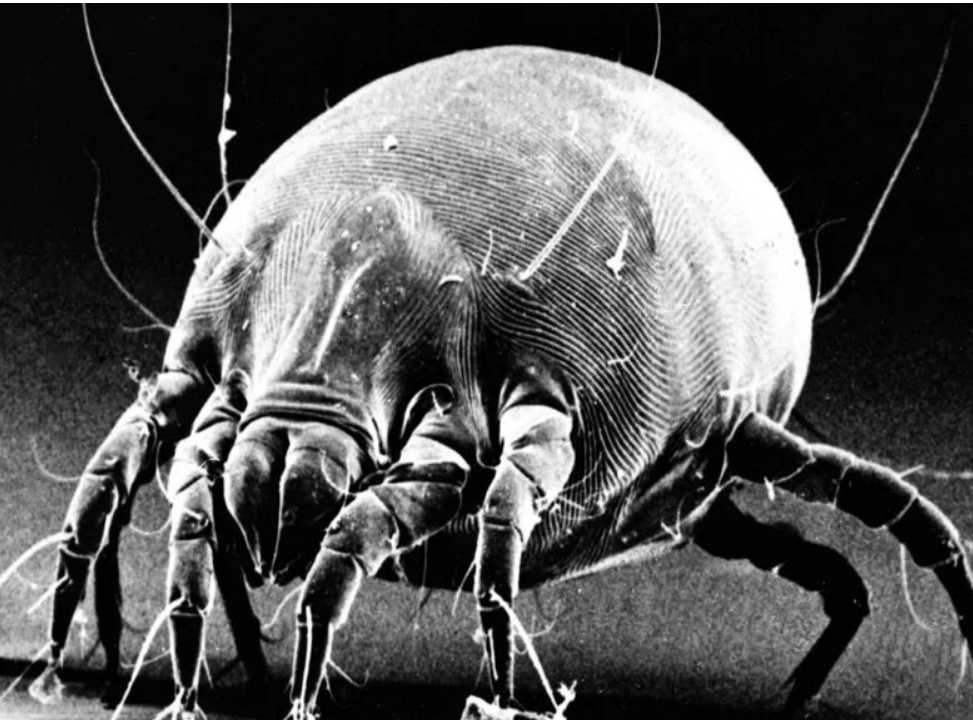
- Popular in media and medical forums
- Symptoms often vague or non-specific
- Lack of data supporting mold exposure as cause of symptoms

Dust Mites

- *Dermatophagoides pteronyssinus*
 - European
- *Dermatophagoides farina*
 - American
- *Dermatophagoides microceras*
 - 3rd most common
- *Euroglyphus maynei*
 - Southern US
- *Blomia tropicalis*
 - Tropical areas



Dust Mite Fun Facts



Unable to see with naked eye

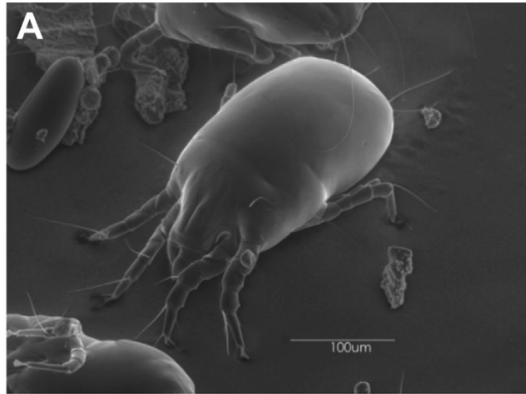
Absorb water from air, feed on human skin flakes

Allergy = fecal material & exoskeleton

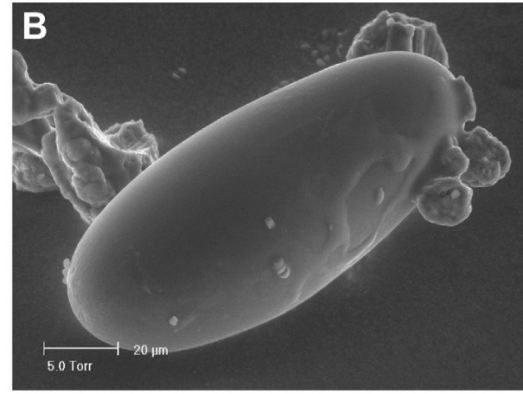
Dust Mites

- Dust mite allergens are large and heavy, settle rapidly
- Most exposure through bedding or upholstered furniture





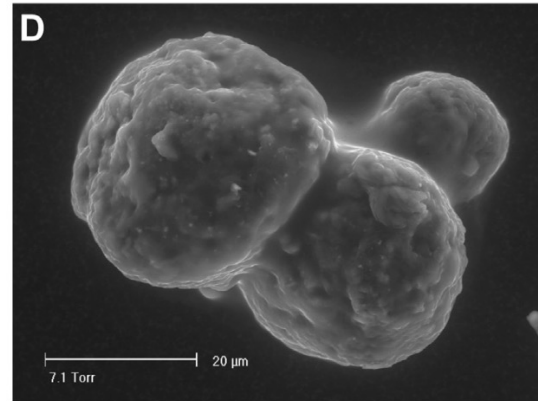
D. pteronyssinus (with egg upper left)



Dust mite egg (with adhering feces)



D. pteronyssinus (ventral view)



Dust mite feces

Dust Mites

- 84% houses in US have detectable DM allergen
- Increased mite concentrations in older, single-family homes, with lower household income

Dust Mite Mitigation

	Item	Cost range (US\$) ^a	Recommendation
Facilitative factors	Temperature/hygrometer	7.50–33.00	Strong
	Dehumidifier	204–414	Strong
	Central air conditioner	Varies	None
Sources	Washing	Varies	Strong
	Acaricides	N/A	Not recommended
	Freezing	Varies	None
Reservoirs	HEPA vacuum cleaner	100–750	Strong
	Mattress encasings	62–220	strong
	Pillow encasings	13–20	Strong
	Mite allergen home test kit	30	Weak
	8-allergen laboratory test kit	200	Weak
	Box spring encasings	19–90	Weak
	Denaturants	7–21	Not recommended
	Barrier-fabric comforter	140–220	None
	Decreasing dust (mops, dust cloth, etc)	5–22	None
	Pathways to occupants	Air filter portable (18 × 20 ft)	182–849
Central air filters		13–21	Moderate
N95 mask		10–12	None

Abbreviations: HEPA, high-efficiency particulate air; N/A, not applicable; none, no recommendation was made in this practice parameter regarding the intervention.

^aPrices are based on quotes found on the Internet by various companies that sell dust mite–control products.

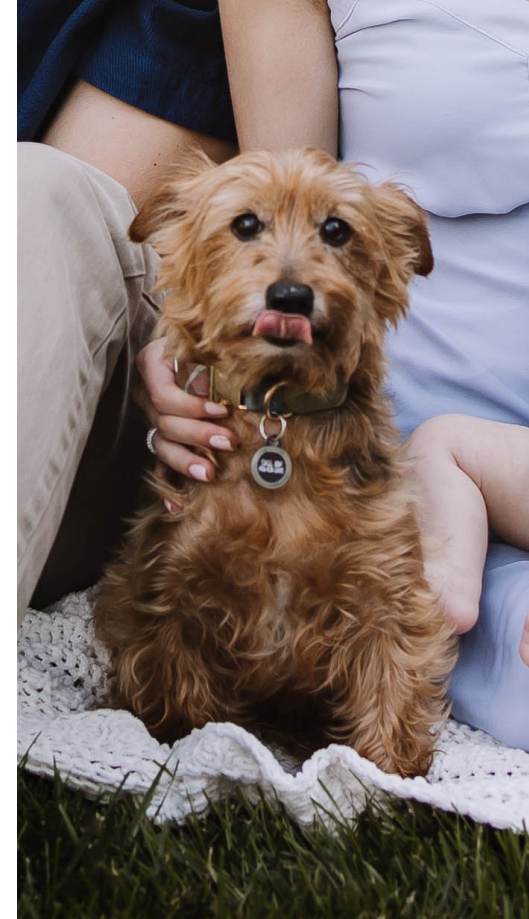
Fur Bearing Animals

- Allergenic proteins present in dander, saliva, and urine
 - Extra “sticky” proteins
- Cats, dogs, guinea pigs, hamsters, rabbits, rats, mice, horses



Hypoallergenic Pets?

- No published scientific literature confirming the existence of "hypoallergenic" breeds of cats or dogs.
 - Mostly a marketing tactic.
 - Even if non-shedding animal, allergenic proteins present in skin, saliva, urine



Hypoallergenic Pets?

Group 1



Group 2



Hypoallergenic Pets?

- However, there are individual animals with lower or higher allergen levels.
- Allergic individuals may tolerate some pets better than others.



Pet Allergy – Mitigation Strategies

Avoidance of pet is ideal... but not often feasible

Create “safe space” in bedroom

Washing dogs twice weekly

Consider HEPA filters

Wash hands after interactions

Can be included in allergy shots

Pet Allergy – Mitigation Strategies

- Allergen Reducing Cat Food

- Reduces amount of allergen produced by cats
- Safe for cats
- Limitation – does not address other cats or “passive exposure” to allergen





Indoor Insect Allergies

COCKROACH ALLERGY

- Most common species
 - *Blattella germanica*
 - *Periplanta americana*
- Allergens found in their feces and saliva
- Mitigation
 - If seen, need professional extermination
 - Avoid leaving food sitting out in kitchen
 - Put pet dishes away after eating
 - Seal entry points (cracks, windows)



ASIAN LADY BEETLE ALLERGY

- *Harmonia axyridis*
- Allergy increasingly reported
 - Rural areas
 - Extracts for skin testing and IgE assays not commercially available
- Mitigation strategies
 - Treat outside of house with pyrethroid chemicals prior to cold weather



Allergy Mitigation



ENVIRONMENTAL CONTROLS
(PREVIOUSLY DISCUSSED)



MEDICATIONS



ALLERGY
IMMUNOTHERAPY/SHOTS

MEDICATIONS

Oral anti-histamines

Intra-nasal steroid sprays

Intra-nasal anti-histamines

Leukotriene inhibitors

Allergy eye drops

ALLERGY IMMUNOTHERAPY

- Can receive allergy shots containing aeroallergens
 - Induces “tolerance” of the immune system
- Therapy lasts 3-5 years
 - Symptoms can recur years later
- But... effective!



A serene winter landscape featuring a snow-covered field with several trees heavily laden with snow. The sky is bright and clear, suggesting a sunny day. The overall scene is peaceful and evocative of a cold winter day.

WINTERTIME ASTHMA

Risk Factors for Asthma Flares in Winter

- Low temperature extremes
- Increased infections
- Increased exposure to indoor allergens

The background of the slide is a dark, monochromatic image of numerous snowflakes. The snowflakes are intricate and detailed, with various six-pointed and star-like shapes. They are rendered in shades of light blue and white against a dark, almost black background, creating a textured, wintry atmosphere. The snowflakes are scattered across the entire frame, with some appearing more prominent than others.

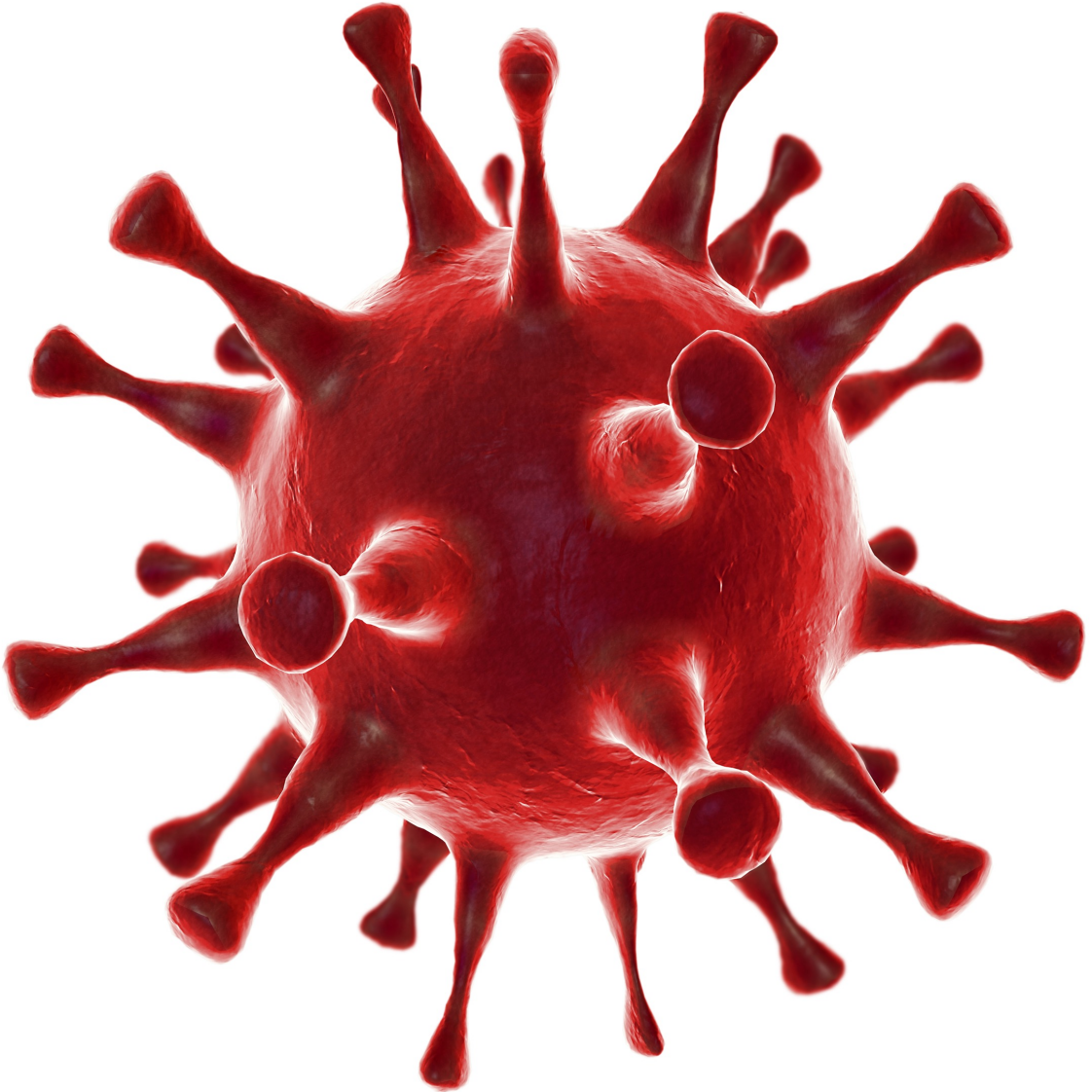
Cold air: known trigger of asthma exacerbations

- **Cold temperatures associated with reduced lung function and increased risk of exacerbations**
- **Finland: a cold winter with an average temperature below the climate normal increased the risk of new asthma by 41%**



Asthma Flares – Indoor Allergens

- More time indoors in winter
- Aeroallergens: known asthma triggers
- Depending on individual allergens, may be spending more time around triggers (animals, cockroach, etc)



Asthma Flares - Infections

- Viral respiratory tract infection
 - Powerful risk factor for asthma exacerbation
 - Seasonal cycle of viral infections – strong impacts during winter months
 - Influenza, coronavirus, and RSV

Asthma Flares - Mitigation

Frequent hand washing, avoiding sick contacts, consider masking around ill

Additional inhaler use at onset of infection

- Injectable medications for severe asthma

Avoiding known aeroallergens, consider allergy shots

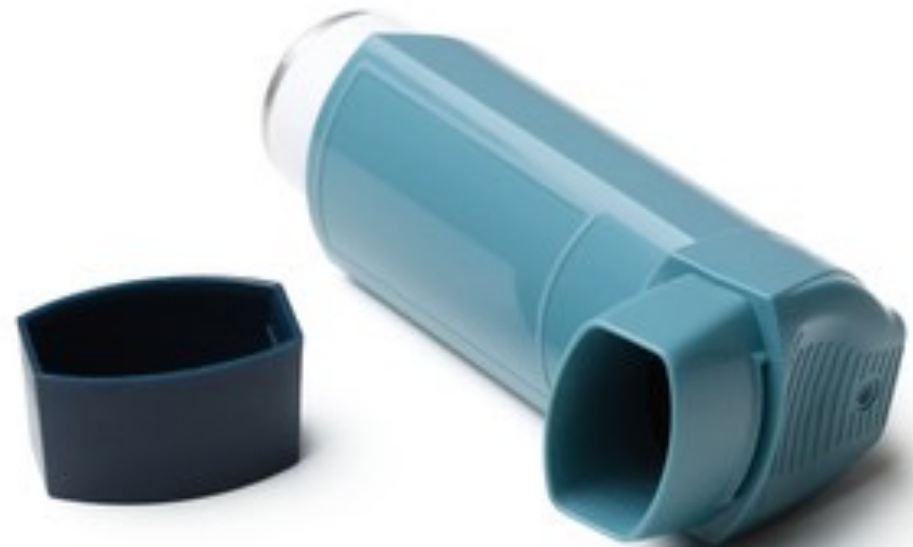
Minimizing exposure to cold air, or considering “pre-treatment”

- Appropriate clothing and gear

Asthma Flares - Mitigation

SMART Therapy: **S**ingle **M**aintenance **A**nd **R**eliever **T**herapy

- Option for single rescue and maintenance inhaler
- Contains bronchodilator component and anti-inflammatory component



SUMMARY

Main allergens that induce symptoms in winter months are indoor allergens such as dust mites, animals/pets, indoor molds, and certain insects.

Treatment options for environmental allergies include environmental controls, medications, and allergy immunotherapy (shots).

Risk factors for asthma flares during the winter are respiratory infections, cold air, and increased exposure to relevant indoor allergens.

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THANK YOU!

