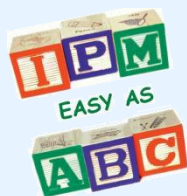


Asthma Triggers in Sensitive Environments

Nebraska Extension



Indoor Air Quality (IAQ) and Health

- ❖ Poor indoor air quality can trigger asthma and other health problems
- ❖ Sources of biological pollutants that can affect indoor air quality:
 - Polluted outdoor air coming indoors
 - Human viruses and bacteria
 - Animal allergens
 - Indoor surfaces and water reservoirs where mold and bacteria can grow (i.e. humidifiers, components of HVAC system)



Health Consequences of Poor Indoor Air Quality

❖ Biological agents in indoor air are known to cause three types of human disease:

- Infections (pathogens invade human tissues)
- Hypersensitivity diseases (specific activation of immune system causes disease)
- Toxicosis (biological toxins cause direct toxic effects)





Health Consequences of Poor Indoor Air Quality

❖ Short-term health effects of pollutants:

- Asthma and wheezing attacks
- Sinus congestion, sneezing, nose itching, coughing
- Headache, fatigue, and shortness of breath
- Eye, nose, throat, and skin irritation
- Dizziness and nausea



Health Consequences of Poor Indoor Air Quality

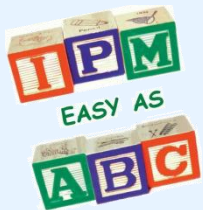
❖ Long-term health effects of pollutants:

- Respiratory diseases
- Heart disease
- Kidney disease
- Lung cancer



Why the Concern about Asthma?

- ❖ It's a serious lung disease
 - Airways constrict making it difficult to breathe
- ❖ Children and adults are susceptible; leading cause of long-term illness in children
- ❖ Asthma episodes result in missed days and increases in medical costs



Why the Concern about Asthma?

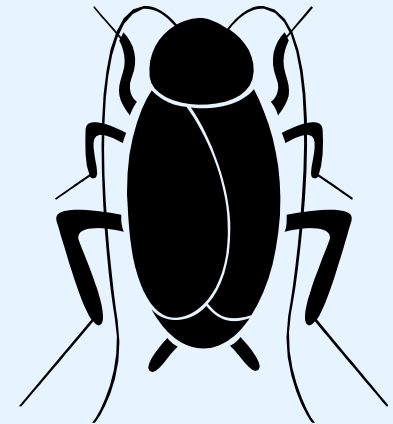
- ❖ NE is in top 1/3 among states for asthma death rates/capita in the U.S.
- ❖ It's the most common chronic childhood disease, affecting about 4.8 million children.



Asthma Triggers

❖ Allergens and Irritants include:

- Molds and other Fungi
- Dust and Dust Mites
- Pet Dander, Saliva
- Cockroaches, Mice, and Rats
- Pollen
- Chemicals and Volatile Organic Compounds (VOCs)
- Secondhand Smoke and Combustion Products



Mold Basics



Mold is a fungi that lives on plant and animal matter. To survive, it requires:

- ❖ Moisture source
- ❖ Food (organic materials)
- ❖ Oxygen

Mold is a pest!



Mold as a Pest

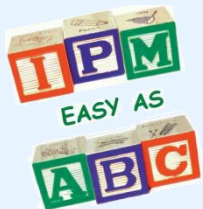
- ❖ Prefers warm, humid, dark places
- ❖ Feeds on damp organic materials
 - Wood, paper, carpet, soil, and other materials
- ❖ Studies link indoor mold and dampness to respiratory problems (especially allergies and asthma)



Preventing Mold



- ❖ Reduce moisture
- ❖ Repair leaks
- ❖ Maintain low indoor humidity (less than 50%)
- ❖ Vent moisture-generating appliances (bathroom and shower vents, dryers, etc.) to the outside



Managing Mold

- ❖ Clean surfaces with detergent and water, and dry completely as first line of attack
- ❖ Mold remediation to contain and clean larger mold infestations
- ❖ Fix water problems and develop maintenance plan



Mold Resources

❖ See the following learning module to get more details about this pest:

➤ *Mold and Indoor Air Quality in Sensitive Environments*

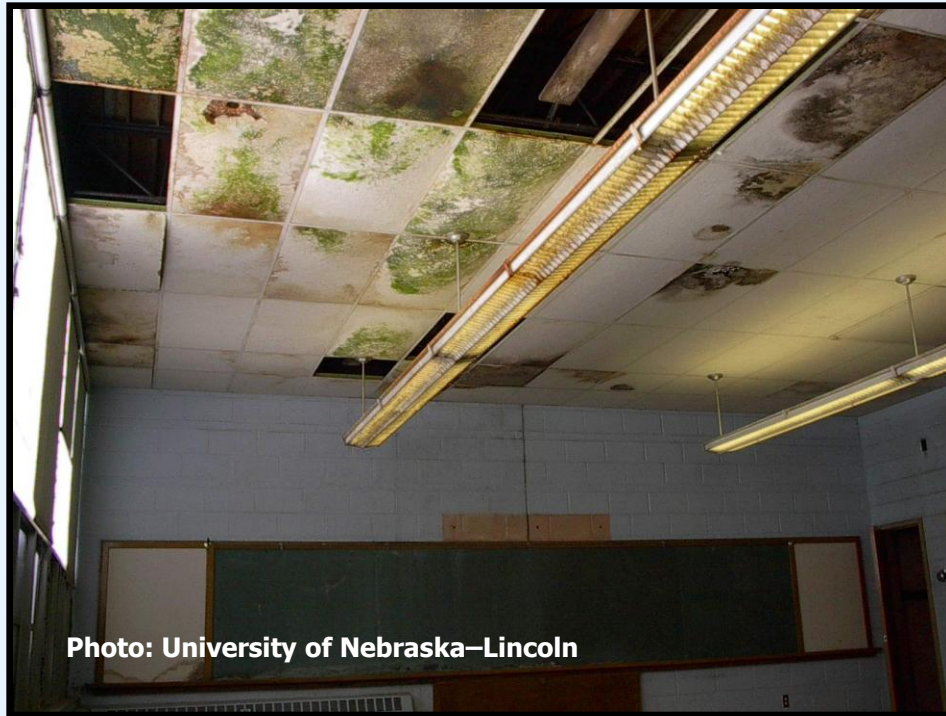


Photo: University of Nebraska–Lincoln



Dust

- ❖ Contains more than 5,000 ingredients including molds, fibers, dust mite allergens, skin flakes, insect body parts, dander, soil, bacteria, and smoke residues.



Managing Dust

- ❖ Use smooth, easy to clean surfaces and washable items in school
- ❖ Damp-clean to remove dust without it becoming airborne
- ❖ Use vacuums with HEPA filters
- ❖ Use high efficiency filters in HVAC systems
- ❖ Change or clean heating or cooling system filters as directed by manufacturer
- ❖ Use high quality mats at the inside and outside of entrances
- ❖ Remove old carpet that has deeply embedded dust and other materials



Dust Mites



Drawing: Nebraska
Extension in
Lancaster County

- ❖ Dust mites common trigger of asthma
- ❖ Live on skin flakes in warm, humid places and soft furnishings such as carpets, stuffed animals, clothes, and furniture



Managing Dust Mites



- ❖ Maintain humidity levels below 50% to help reduce the population
- ❖ In schools or daycares, wash all mats, stuffed toys, and bedding in hot water each week. Avoid mats or furnishings that are more difficult to clean
- ❖ Use hard, smooth surfaces where possible



Managing Dust Mites

- ❖ Remove clutter and keep toys that can be easily washed. Some can be put in freezer overnight to reduce dust mites
- ❖ Damp-clean surfaces; steam clean carpets and dry well within 24 hours
- ❖ Clean and vacuum used upholstered furniture on a regular basis



Classroom Pets

Photo: University of Nebraska–Lincoln

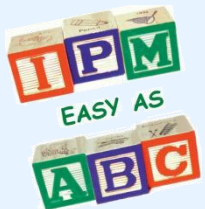


Photo: University of Nebraska–Lincoln

❖ Classroom pets in schools and daycares can trigger asthma

➤ Skin flakes, saliva, and urine can be triggers

➤ Rodents and cats are more common triggers than dogs





Managing Classroom Pets

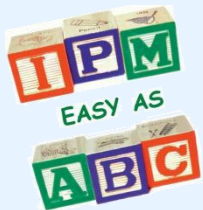
- ❖ Clean classrooms where pets are kept
- ❖ Keep pets away from furniture, stuffed toys, and carpeting
- ❖ Isolate pets in a confined area of the classroom
- ❖ Keep pets that are less likely to be asthma triggers (i.e. non furred or feathered)





Cockroaches and Rodents

- ❖ Cockroach exposure aggravates asthma in people allergic to them
- ❖ Body parts, hairs, saliva, and excrement are triggers
- ❖ A National Institutes of Health/National Institute of Environmental Health Sciences study reported that **cockroach allergens worsen asthma symptoms more than pet allergens or dust mites.**



Managing Cockroaches and Rodents

- ❖ Seal food and garbage in airtight, non-chewable containers
- ❖ Clean up all food crumbs and spilled liquids right away
- ❖ Keep areas clean where food is stored, eaten, and prepared, including snack areas





Photo: University of Nebraska—Lincoln

Managing Cockroaches and Rodents

- ❖ Wash dishes and food surfaces soon after use
- ❖ Limit food consumption in non-cafeteria areas
- ❖ Repair leaks and other moisture problems
- ❖ Dispose of cardboard boxes and clutter
- ❖ Seal openings around water pipes and other places where pests can enter around doors, cabinets and windows



Managing Cockroaches and Rodents

- ❖ Empty trash and remove from building daily
- ❖ Caulk and/or weather strip entry points
 - Holes, cracks, crevices
- ❖ Fix screens and windows
- ❖ Use Integrated Pest Management principles



Managing Cockroaches and Rodents

- ❖ Use least toxic products
- ❖ Limit treatment area and provide plenty of ventilation
- ❖ Keep asthmatics out of the treated area
- ❖ Read and follow label instructions carefully!



Cockroaches and Rodents Resources

- ❖ See the following learning modules to get more details about these pests:
 - *Cockroach Management*
 - *Mice and Rats in and around Sensitive Environments*

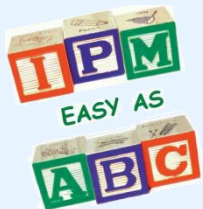


Photo: University of Nebraska–Lincoln



Pollen from Plants

- ❖ Many plants cause allergy symptoms
 - Symptom appearance depends on time of bloom and pollen production; may include ragweed, grasses, and pine, birch, or oak trees
- ❖ Some people suffer from allergic rhinitis ("hay fever")



Managing Pollen



Photo: University of Nebraska–Lincoln

- ❖ Plan landscaping carefully to avoid known problematic pollen producing plants
- ❖ Pollen transported by wind; may enter buildings through doors, windows, cracks, and on clothing
- ❖ Place quality mats at every entrance inside and out to trap pollen on shoes
 - At least 12 walking steps



Managing Pollen

- ❖ Use quality doors, windows, and screens. Fix holes in screens
- ❖ Caulk and weather strip to seal areas around windows
- ❖ Run air conditioning and keep doors and windows closed during peak pollen shedding times
- ❖ Use vacuum with HEPA filter
- ❖ Damp-clean surfaces



Volatile Organic Compounds (VOCs)

❖ VOCs evaporate from:

- Adhesives
- Solvents
- Cleaners
- Personal products, perfumes, air fresheners
- Pesticides
- Paints
- Art supplies
- Chemistry class supplies
- New materials
 - ✓ Carpet, cabinets, etc.



Managing VOCs

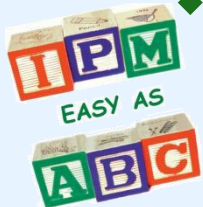
- ❖ Choose water-based and non-aerosol products or those labeled as low or no VOCs
- ❖ Keep caps and lids tight
 - Store away from students, residents, and staff, in separate building if possible
- ❖ Avoid using around known asthmatics
- ❖ Select low VOC containing materials
 - i.e. No formaldehyde
- ❖ Choose unscented products



Secondhand Smoke and Combustion

These pollutants can come in through the ventilation system and linger on walls and surfaces long after the source is gone.

- ❖ Cigarette smoke
- ❖ Combustion (from gas furnaces, water heaters, etc.)
- ❖ Exhaust (from buses, cars, etc.)



Secondhand Smoke

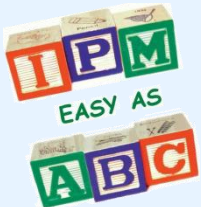
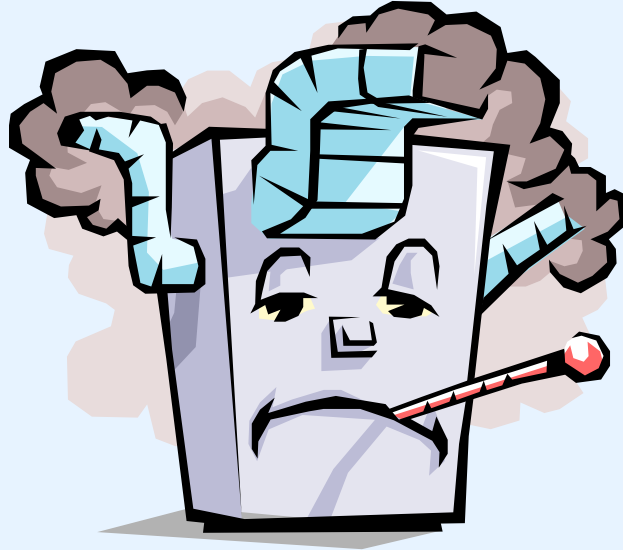


- ❖ Aggravates asthma symptoms
- ❖ Risk factor for new asthma cases
- ❖ Is likely to cause respiratory and other illnesses such as bronchitis, pneumonia, and ear infections
- ❖ Prohibit smoking inside facilities or other sensitive areas



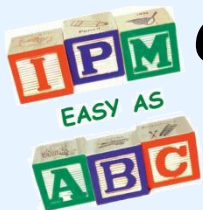
Combustion

- ❖ Aggravates breathing problems in asthmatics
- ❖ Includes soot, smoke, and gases such as sulfur dioxide and nitrogen dioxide



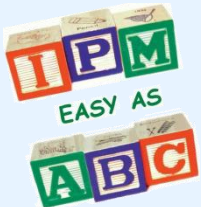
Managing Combustion

- ❖ Service heating and cooling equipment annually
- ❖ Provide adequate exhaust and intake ventilation to combustion equipment
- ❖ Use hood ventilators when cooking
- ❖ Limit/avoid use of wood-burning items, kerosene heaters, and candles
- ❖ Do not burn yard waste near sensitive environments



Managing Combustion

- ❖ Minimize bus idling time near entrances or HVAC intake vents to reduce hazardous diesel fumes and emissions
- ❖ Block intake of exhaust fumes
 - Keep doors and windows closed near bus loading areas



Additional Resources

❖ Asthma and Allergy Foundation of American

➤ <http://www.aafa.org>

➤ 1-800-7ASTHMA

❖ American Lung Association

➤ <http://www.lungusa.org>

➤ 1-800-586-4872



Credits

❖ Content Specialist

- Shirley Niemeyer, Nebraska Extension Professor Emeritus

❖ Content Editor

- Erin Bauer, Nebraska Extension

❖ Photos

- Shirley Niemeyer, Nebraska Extension Professor Emeritus

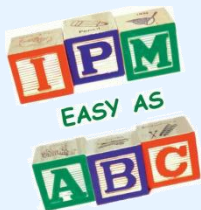


Note: Photos and artwork not credited are public domain/clipart

Credits

❖ Photos/Drawings

- USDA
- Erin Bauer, Nebraska Extension
- Nebraska Extension in Lancaster County



Note: Photos and artwork not credited are public domain/clipart