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Indoor Air Quality: Know the Asthma Triggers in the Home

Shirley M. Niemeyer, Extension Specialist, Housing and Environment

Asthma attacks can be triggered by things found in the home. Through specific management methods, the impact the triggers have on individuals can be lessened. Always consult medical professionals beforehand, and follow their recommendations.

Not all asthma triggers are listed is this publication. Consult with a health professional for more information about asthma, potential triggers, and how to manage specific problems. The information contained here is not a substitute for professional medical help or your doctor's recommendations.

Common Asthma Triggers Found in the Home

The National Academy of Sciences (NAS) has found a causal relationship between the development of asthma and house dust mites. It also has found that asthma worsened for sensitized persons exposed to:

- cat allergen
- cockroach residue
- damp indoor spaces
- dogs
- environmental tobacco smoke (especially among preschool children)
- fungi or molds
- nitrogen dioxide and nitrogen oxides
- rhinovirus

When allergens and irritants are found in homes, asthma attacks may be triggered. People may reduce their risk of an asthma attack, prevent asthma from getting worse, and perhaps avoid the onset of asthma entirely by controlling their physical environment. Some common household triggers and methods that can be used to manage them are discussed below.

Secondhand Smoke

Environmental tobacco smoke, or secondhand smoke, may aggravate symptoms in children with asthma, and may contribute to the development of asthma in children.

Asthma is a serious lung disease and is the leading cause of long-term illness in children. By 2020, asthma is expected to strike 1 in 14 Americans and 1 in 5 families, according to a National Health Interview Survey conducted by the National Center for Health Statistics in 2001.

In addition:

- Asthma is the number one cause of school absences attributed to chronic illnesses, with 14 million school days lost per year[1].
- Asthma ranks third as the cause of hospitalization among children age 15 and under[2].
- The health consequences of asthma each year in the U.S. include over 5,000 deaths, 479,000 hospitalizations, and 100 million days of restricted activity.
- The cost to the U.S. economy is about $14 billion each year[3].

[1]Pew Environmental Health Commission, May 2000
[2]Centers for Disease Control and Prevention. Surveillance for Asthma – United States, 1980-1999
[3]National Heart, Lung and Blood Institute, 2002

Children exposed to secondhand smoke also are more likely to suffer from pneumonia, bronchitis, and other lung diseases, as well as ear infections. Children whose mothers smoked during pregnancy tend to be born with smaller airways, which increases their chances of developing asthma.

Management Methods

- Choose not to smoke in your home or car, and do not allow others to do so.

- Smoke particles and odors linger on walls and other surfaces, continuing to give off particles and gases after smoking has stopped. They are difficult to remove. Deep clean any home that has had smokers present, repaint with low volatile organic compounds (VOC) paint, and have all furnishings and items cleaned.

Combustion Products

Combustion products such as soot and smoke, and gases such as sulfur dioxide and nitrogen dioxide can cause breathing problems in children with asthma.

Management Methods

- Have heating and cooking equipment, such as gas ranges, serviced yearly.
- Provide adequate exhaust and intake ventilation to the combustion equipment. Use range hoods that exhaust to the outside.
- Limit or avoid the use of wood-burning stoves, kerosene heaters, fireplaces, and candles.
- When purchasing, select closed combustion water heaters and furnaces.

Dust

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

Management Methods

- Use rugs or mats on the inside and outside of entrance doors. They should be long enough to allow at least six walking steps. Clean the rugs or mats weekly.
- Choose smooth, easy-to-clean surfaces and washable items.
- Use a damp-clean method to remove dust and prevent it from becoming airborne.
- Use vacuums with High Efficiency Particle Air (HEPA) filters, which catch and retain the dust.
- Change or clean heating and cooling system filters as directed by the manufacturer.
- Leave shoes worn outdoors at the door, and put on different shoes or slippers.
- Wipe pets' paws as they enter.
- Remove carpets and pads that may have deep imbedded dust, pollen, dust mite parts, etc.

Dust Mites

Dust mites are microscopic creatures and one of the principal irritants in house dust. They live in warm, humid places and in soft furnishings such as mattresses, pillows, carpets, fabric-covered furniture, bedcovers, clothes, and stuffed toys. They are difficult to control.

Management Methods

- Reduce humidity to between 30 percent and 45 percent, and use good cleaning strategies.
- Cover mattresses, box springs, and pillows with covers labeled for dust mite control.
- Wash all bedding each week in hot water (130°F) to reduce the dust mites and their deposits or parts. Dry on the hot temperature setting.
- Avoid comforters or furnishings that are difficult to wash or clean.
- For particularly sensitive persons, replace pillows and quilts every year or two.
- For ease of cleaning, use hard surfaces in the bedroom, including floors, furnishings, and window treatments.
- Remove clutter and stuffed toys. Keep stuffed toys off the bed. Select stuffed toys that can be washed or choose hard surfaced toys. Some toys can be put into the freezer for a few days to reduce dust mites, then cleaned.
- Damp clean and use a vacuum with a HEPA filter.

Pets

Animal skin flakes, urine, and saliva can be asthma triggers. Cats and rodents are more likely to be triggers than dogs.

Management Methods

- If a pet is a trigger, keep the pet out of the bedroom and sleeping areas, or keep it outdoors. If necessary, find another good home for it.
- Keep pets away from fabric-covered furniture, carpets, and stuffed toys.
- Select a pet that is not an asthma trigger for the individual.
- Clean surfaces and vacuum with a HEPA filter vacuum.

Molds

Molds are microscopic fungi that live on plant or animal matter. Growth is encouraged by warm and humid conditions — above 60 percent relative humidity. Molds are naturally occurring and are found both indoors and outdoors. Certain molds may be toxic to some people. Mold should be handled with respect due to the potential health risk.

Management Methods

- First control moisture. Reduce humidity to between 35 percent and 50 percent. Use dehumidifiers.
- Stop all unplanned moisture sources and leaks, fix leaks, and keep all surfaces dry. Clean out downspouts and gutters, and use downspout extenders to move water at least 6 feet from the foundation.
- Slope soil at the foundation away for drainage. Seal foundation cracks.
- Don't allow water to stand or seep inside or out.
- Use exhaust vents in bathrooms and over ranges to move moisture to the outside. Vent dryers to the outside.

- Clean refrigerator drip pans and dehumidifiers often.
- Avoid covering basement floors with carpet, which may wick moisture.
- To manage a small amount of mold — less than about 10 square feet — correct the water or humidity problem and clean up the mold. For larger areas, hire a professional.

Household members, especially infants and sensitized persons, should not be present during cleanup. Wear gloves, protective clothing, and an air filter mask, or hire a professional to reduce the risk. Work in a well-ventilated area. Using a general purpose cleaner (such as borax) and water, clean the mold from hard surfaces, trying not to spread the spores. Thoroughly dry the area. Carefully discard small amounts of wet or moldy absorbent materials such as ceiling tiles, soft furnishings, and carpet. Before removal, wrap the items in plastic to seal and avoid spreading spores.

Insects and Rodents

Exposure to household pests such as cockroaches and rodents can trigger asthma in some individuals. Many people with asthma are allergic to the dried droppings and cast off skins of cockroaches.

Management Methods

- Keep all food (including pet food) and garbage in sealed airtight containers. Keep surfaces and storage areas clean.
- Control water leaks. Get rid of standing water.
- Dispose of cardboard boxes and clutter.
- Seal openings around water pipes, utility entrances, and other cracks and openings where pests may enter the home. Weatherstrip and caulk doors and windows, in and around cabinets, and any crack or space that may allow entry. To reduce mice entry, use metal or metal mesh scrubbers in the spaces and holes before sealing with caulk or other type of sealant.
- For pest control, use traps, sticky traps, and other low-toxic control methods. Consult with your local extension office about nontoxic methods.
- Deep clean the infested areas, including around and under baseboards, stoves, sinks, and places where food is stored, as well as around water. Keep persons with asthma out of the area when cleaning.

Pollen

Typical pollens to which people are allergic include grasses, ragweed, and pine, birch, and oak trees. Pollens enter through doors, windows, and other home openings.

Management Methods

- Use quality doors, windows, and screens. Fix holes in screens and windows.
- Caulk and weatherstrip.
- Keep doors and windows closed, and the air conditioning on, during peak pollen seasons.
- After spending time outdoors during pollen seasons, shower and change clothes to avoid spreading pollen indoors.
- Place rugs at the outside and inside of all entrance doors (they should be long enough to allow at least six walking steps), and wash weekly.
- Vacuum with an efficient vacuum that has a HEPA filter. Wet clean or damp mop where possible.
- Clean or change heating and cooling system filters as recommended.

Volatile Organic Compounds

Volatile organic compounds (VOCs) are emitted or given off as gases from certain solids or liquids. They are found in items such as building materials, paints, glues, pesticides, solvents, and cleaners. They also can be found in scented products, perfumes, and other personal care items. Formaldehyde found in building materials is an example of a VOC.

Management Methods

- Avoid storing solvents; buy only what you need.
- Keep container lids tight.
- Read labels on containers. Choose water-based products and nonaerosol products when choices are available.
- Choose unscented products.
- Store products that emit VOCs in a detached storage unit or area if possible, and if extremes in temperature do not affect the product.
- Ventilate.

Other Potential Asthma Triggers

There are many other asthma triggers. Personal care products, air fresheners, other scented products, and perfumes may be triggers for some people.

Some mechanical air cleaners intentionally give off ozone. Ozone is a lung irritant and may aggravate asthma. It increases the risk of harmful respiratory effects, especially in children.

People with asthma should work with their physician and health care professionals to determine specific pollutants that trigger asthma, how to reduce the triggers, and how to manage their asthma.

Summary

Indoor air pollutants can trigger asthma attacks and may lead to its onset. Totally eliminating triggers may be unrealistic, but certain management methods may help control the trigger. The effectiveness of management methods depends on the pollutant source, how significant of an asthma trigger it is for a particular individual, medical recommendations, and feasibility of control.

The following are steps to manage pollutants. They are listed in order of effectiveness after medical recommendations.

1. Identify and reduce the pollutant at the source. Control pests' habitat, create barriers to entry, and do not bring pollutants into the home.
2. Ventilate — mix or dilute pollutants with fresh outside air. Exhaust pollutants.
3. Evaluate air cleaners by the type and percentage of air particles removed, and the volume of air filtered during a specific time period. Air cleaners are generally not designed to remove gases, although those with charcoal will remove some but will need careful maintenance.

Resources

American Academy of Allergy, Asthma, & Immunology — *http://www.aaaai.org*
American Academy of Pediatrics — *http://www.aap.org*
American Lung Association — *http://www.lungusa.org*
Centers for Disease Control and Prevention — *http://www.cdc.gov/asthma/*
National Academy of Sciences Asthma Report. Clearing the Air 2000.
National Asthma Education and Prevention Program — *http://www.nhlbi.nih.gov*
U.S. Environmental Protection Agency — *http://www.epa.gov/iaq*

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