Air Pollution and Asthma

This category covers a wide range of toxic chemicals and pollutants, whether from industrial or vehicle pollution outdoors, or from the use of wood stoves, volatile organic compounds, or other substances indoors. Combustion by–products (e.g., nitrogen dioxide) and other pollutants can be respiratory irritants. Solvents and other chemicals can be found in building materials and can volatize during the 1-2 year period after new construction. Diesel exhaust from school buses and other forms of air pollution can also worsen asthma. Health care providers may want to sign up for Enviroflash email or pager notification of air quality forecasts in areas where it is offered. (For more information, see: http://www.enviroflash.info/)

Additional History Questions to Supplement the History Form:

Indoor Air Pollution Questions

- Do you live in a home that was built in the past 1-2 years?
- If you recently made changes to your house – installed new carpets, painted, or other changes – how long ago was that?
- Was there a change in your child's asthma symptoms after moving to a new house or having the work mentioned above done in your home?
- Do you ever notice a chemical smell in your home?
- If you have a wood burning fireplace or stove, how many times per month in the winter do you use it?
- Does anyone in your house use strong-smelling perfumes, scented candles, hairsprays, or other aerosol substances?

Outdoor Air Pollution Questions

- Do you live within 300 yards of a major roadway or highway? _____ An area where trucks or other vehicles idle? _____ A major industry with smokestacks? _____
- Is residential or agricultural burning a problem where you live?
- How do you hear about air quality alerts?

Possible Interventions:

For **indoor** air pollution, the two best approaches to reducing indoor air pollution are source control and ventilation.

- **Eliminate tobacco smoke**
- **Use good housekeeping practices to control particles**
- **Install an exhaust fan close to the source of contaminants, and vent it to the outside**
- Properly ventilate the room where a fuel-burning appliance is being used
- Ensure that wood stove doors are tight-fitting
- Follow manufacturers' instructions when using an unvented kerosene or gas space heater
- Ensure that fireplaces are properly vented so smoke escapes through the chimney
- Never use a gas-cooking appliance as a heating source
- Open windows especially when indoor pollutant sources are in use (this option must be balanced against the concern of mold or other plant allergens and outdoor air pollution)
- Parents should change clothes prior to returning from work if they work around any strong smelling chemicals or paints or other toxic substances
- Avoid strong odors and minimize use of products and materials that emit irritants, such as smoke, strong perfumes, talcum powder, hair sprays, cleaning products, paint fumes, sawdust, chalk dust, air freshener sprays, and insect sprays

Outdoor air pollution, especially ozone and particulate matter can increase asthma symptoms.

- **Monitor air quality index levels and reduce your child's outdoor activities when the AQI is in the unhealthy range**
- **If your child's symptoms are worse or he/she requires more albuterol (rescue medicine) the day after AQI levels are in the unhealthy range, contact your health care provider**
- Use HEPA filters in household vents
- Reduce use of candles, wood-burning stoves and fireplaces
- If particle pollution levels are high outdoors, do not vacuum the floor since this increases particle levels indoors
- Advise your child to stay away from the exhaust pipe of idling school buses and trucks
- Consider moving to a new location if this is possible

Follow-Up / Notes:

Animal Allergens and Asthma

Additional History Questions to Supplement the History Form

- What type of furry pet(s) do you have (and how many of each)?
- Is it a strictly indoor pet? _____ outdoor? _____ indoor/outdoor? _____
- Does your child sleep with the pet?
- Has your child's asthma become worse since having the pet?
- If you moved your pet outdoors, did your child's asthma improve?
- If there is evidence of rodents in your home, how severe is the problem (mild, moderate, severe, very severe)
- Does your child's classroom (or other places he/she spends time) have a furry pet that he/she plays with?

Possible Interventions:

Interventions with regard to pets should only be recommended if the child is allergic to the animal. Testing should therefore be done before making any recommendations. To reduce your child's exposure to animal allergens, the first two options below have been shown to be the most effective:

- **Consider finding a new home for indoor cats, dogs, and pet rodents**
- **At a minimum, keep pets outside**
- If neither of those are possible, the following may help reduce exposure:
- Keep pets out of the child's bedroom
- Encase mattresses and pillows
- Remove carpets
- Vacuum regularly using a cleaner with a HEPA filter or a double-layered microfilter bag (when the child is not around)
- Use portable air cleaner with HEPA filter for child's bedroom
- **Avoid use of ozone generators and certain ionic air cleaners which can actually generate harmful ozone**
- Keep pets off furniture and out of cars
- Bathing cats and dogs has been shown to decrease these allergens, however, it must be done at least twice a week to be effective
- **If rats or mice have been observed, use the least toxic extermination method, such as traps and baits**
- **Also use methods listed for cockroach control (See Cockroach Allergen and Asthma fact sheet on page 22)**

Follow-Up / Notes:

PETS & ANIMALS

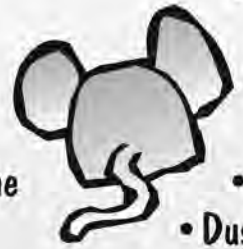
Many people think animal allergies are caused by the fur or feathers of their pet. In fact, allergies are actually aggravated by:

- proteins secreted by oil glands and shed as dander
- proteins in saliva (which stick to fur when animals lick themselves)
- aerosolized urine from rodents and guinea pigs

Keep in mind that you can sneeze with and without your pet being present. Although an animal may be out of sight, their allergens are not. This is because pet allergens are carried on very small particles. As a result, pet allergens can remain circulating in the air and remain on carpets and furniture for weeks and months after a pet is gone. Allergens may also be present in public buildings, schools, etc. where there are no pets.

Preventive Strategies

- Remove pets from your home if possible.
- If pet removal is not possible, keep them out of bedrooms and confined to areas without carpets or upholstered furniture.
- If possible, bathe pets weekly to reduce the amount of allergens.



- Wear a dust mask and gloves when near rodents.
- After playing with your pet, wash your hands and clean your clothes to remove pet allergens.
- Avoid contact with soiled litter cages.
- Dust often with a damp cloth.

NIEHS
National Institute of Environmental Health Sciences

http://www.niehs.nih.gov/health/topics/conditions/asthma/pets.cfm

Cockroach Allergen and Asthma

Additional History Questions to Supplement the History Form:

- Approximately how many cockroaches do you see in your home on a daily basis?
- Do you see evidence of cockroach droppings?
- How do you get rid of the cockroaches in your home?
- Does your child's school (or other places she/he spends time) have cockroaches?

Possible Interventions:

Eradication can be very difficult, especially in apartment buildings, and it is often temporary. Roaches follow food and water sources in your house. In general, the **least toxic methods of roach control should be employed first.**

- **Clean up all food items/ crumbs/ spills as soon as possible**
- **Store food and trash in closed containers**
- **Limit spread of food around house, especially bedrooms**
- **Fix water leaks under sinks**
- **Mop kitchen floor at least once a week**
- **Clean counter tops daily**
- Take garbage out daily
- Check for and plug up crevices outside your house that cockroaches may enter
- **Use the integrated pest management (IPM) approach for extermination — least toxic methods first**
- Use boric acid powder under stoves and other appliances
- Use bait stations and gels. It is highly recommended to use a professional, licensed exterminator.
- If you choose to apply the pesticides yourself, read the product label and follow all directions carefully
- Avoid using liquid sprays inside the house, especially near places children crawl, play, or sleep
- **Never attempt to use industrial strength pesticide sprays that require dilution**

Follow-Up / Notes:

Dust Mites and Asthma

Dust mites are tiny microscopic relatives of the spider that live on mattresses, bedding, upholstered furniture carpets, and curtains. These tiny creatures feed on the flakes of skin that people and pets shed daily, and they thrive in warm and humid environments.

Additional History Questions to Supplement the History Form

- Did you know that dust mite exposure can trigger asthma symptoms?
- What type of floor covering is in your child's bedroom?
- Do you have a vacuum cleaner with a HEPA filter?
- What have you tried so far to reduce dust/dust mite exposure?
- How often do you wash your child's bed linens?
- Are you currently using a mattress or pillow covering on your child's bed?
- Do you use other ways to decrease dust mite exposure?

Possible Interventions:

No matter how clean a home is, dust mites cannot be totally eliminated. The following suggestions can reduce exposure. Emphasis should be placed on reducing dust mite exposure where the child sleeps.

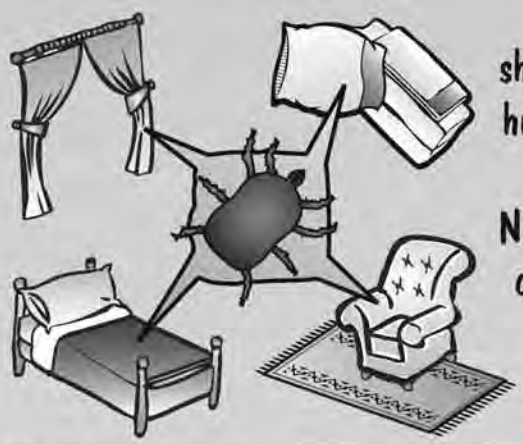
- **Encase all pillows and mattresses of the beds that the child sleeps on using allergen impermeable encasings.** (There are numerous sources for allergen impermeable encasings, and prices as well as quality may vary.)
- **Wash bedding weekly to remove allergen. Wash in hot water (130˚ F) to kill mites**
- Replace wool or feathered bedding with synthetic materials that will withstand repeated hot water washing
- Either remove from the bedroom or wash and thoroughly dry stuffed toys weekly
- Move stuffed toys away from the pillow the child sleeps on
- Vacuum once or twice weekly preferably using a vacuum cleaner with a HEPA filter or a double-layered microfilter bag (when the child is not around)
- Use a damp mop or rag to remove dust, not a dry cloth that just stirs up dust mite allergens
- Avoid use of humidifiers
- The following interventions are expensive and are only recommended after an allergist has identified your child as allergic to dust mites:
- Consider replacing draperies with blinds or other wipeable window covering
- Consider carpet removal in the child's bedroom
- Consider removing upholstered furniture
- **Avoid use of ozone generators and certain ionic air cleaners which can actually generate harmful ozone**

Follow-Up / Notes:

DUST MITES

Dust mites are tiny microscopic relatives of the spider and live on mattresses, bedding, upholstered furniture, carpets and curtains.

These tiny creatures feed on the flakes of skin that people and pets shed daily and they thrive in warm and humid environments.



No matter how clean a home is, dust mites cannot be totally eliminated. However, the number of mites can be reduced by following the suggestions below.

Preventive Strategies

- Encase your mattress and pillows in dust-proof or allergen impermeable covers (available from specialty supply mail order companies or some bedding and department stores).
- Wash all bedding and blankets once a week in hot water (at least 130-140° F) to kill dust mites. Non-washable bedding can be frozen overnight to kill dust mites.
- Replace wool or feathered bedding with synthetic materials and traditional stuffed animals with washable ones.
- If possible, replace wall-to-wall carpets in bedrooms with bare floors (linoleum, tile or wood) and remove fabric curtains and upholstered furniture.
- Use a damp mop or rag to remove dust. Never use a dry cloth since this just stirs up mite allergens.
- Use a dehumidifier or air conditioner to maintain relative humidity at about 50% or below.
- Use a vacuum cleaner with either a double-layered microfilter bag or a HEPA filter to trap allergens that pass through a vacuum's exhaust.
- Wear a mask while vacuuming to avoid inhaling allergens, and stay out of the vacuumed area for 20 minutes to allow any dust and allergens to settle after vacuuming.

NIEHS
National Institute of Environmental Health Sciences

http://www.niehs.nih.gov/health/topics/conditions/asthma/dustmites.cfm

Mold/Mildew and Asthma

Mold spores are allergens that can be found both indoors and outdoors. Molds are found indoors in dark, warm, and humid environments such as basements, attics, bathrooms, and laundry rooms. They are also found in air conditioners, humidifiers, refrigerator drip trays and garbage pails. Molds grow outdoors in moist shady areas. They are common in soil, decaying vegetation, compost piles, rotting wood, and fallen leaves. Mold growth outdoors is seasonal, first appearing in early spring and thriving until the first frost.

Additional History Questions to Supplement the History Form:

- Do you see mold growth in any part of your home?
- How large an area is the mold growth? (i.e. greater than 3 ft. x 3 ft?)
- Does your child's school (or other places he/she spends time) have mold growth?
- Do you have problems with moisture or leaks in your home?
- Do you frequently have condensation on your windows?
- Have you tried using something to decrease the humidity in your home?

Possible Interventions:

The emphasis should first be on controlling all sources of moisture in the house. Items that are too moldy to clean should be discarded. The size of the mold contamination in the house should determine how the mold gets cleaned up. Generally, an area of 3 feet x 3 feet or larger should be cleaned by a professional.

- Check faucets, pipes, and ductwork for leaks and repair as soon as possible
- Control indoor humidity
  - Use a dehumidifier or air conditioner (non evaporative or water-filled type) to maintain indoor relative humidity below 50%
  - Clean the dehumidifier as instructed by the manufacturer
  - Do not use a humidifier
  - Vent bathrooms and clothes dryers to the outside
  - Install and use exhaust fans in the kitchen, baths and damp areas
  - Avoid carpet and wallpaper in rooms prone to dampness
  - For those who own a home with an evaporative cooler, control the humidity level with a dehumidifier
- When first turning on home or car air conditioners, have your child 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
- Your child should avoid raking leaves, mowing lawns, or working with peat, mulch, hay, or dead wood if he/she is allergic to mold spores
- Clean small areas with detergent and water. Chlorine bleach solution diluted 1:10 provides cosmetic improvement and kills mold, but does not remove allergens. Be aware of respiratory irritant effect of bleach. Do not mix bleach and ammonia.
- For extensive mold contamination, (greater than 9 square feet – 3 ft. x 3 ft.) professional removal is recommended.

Follow-Up / Notes:

MOLD SPORES

Several molds that grow both indoors and outdoors, produce allergenic substances. These allergens can be found in mold spores and other fungal structures (e.g. hyphae). There is no definite seasonal pattern to molds that grow indoors. However outdoor molds are seasonal, first appearing in early spring and thriving until the first frost.

Indoor molds are found in dark, warm, humid and musty environments such as damp basements, cellars, attics, bathrooms and laundry rooms. They are also found where fresh food is stored, in refrigerator drip trays, garbage pails, air conditioners and humidifiers.

Outdoor molds grow in moist shady areas. They are common in soil, decaying vegetation, compost piles, rotting wood and fallen leaves.

Preventive Strategies

- Use a dehumidifier or air conditioner to maintain relative humidity below 50% and keep temperatures cool.
- Vent bathrooms and clothes dryers to the outside, and run bathroom and kitchen vents while bathing and cooking.
- Regularly check faucets, pipes 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 must do yard work, wear a mask and avoid working on hot, humid days.

NIEHS
National Institute of Environmental Health Sciences

http://www.niehs.nih.gov/health/topics/conditions/asthma/mold.cfm

Environmental Tobacco Smoke and Asthma

Cigarette smoke contains many toxic chemicals and irritants. Children exposed to tobacco smoke have increased asthma exacerbations and other problems, including lower respiratory infections and middle ear infections. Infants have an increased risk of sudden infant death syndrome. Simply "smoking outside" is not enough to limit the harm to children from tobacco smoke. Remember that smoke settles in clothes, hair, car upholstery, and furniture. Once a parent or a caregiver acknowledges that he/she smokes, the provider should consider writing a referral for a smoking cessation or a community support program.

Additional History Questions to Supplement the History Form:

- Who in the family smokes cigarettes?
  How many cigarettes per day?
  Does he/she (they) smoke in the house? _____
  Outside? _____ Both inside and outside? _____ In the car? _____
- Does anyone who spends time at your house smoke (friends, neighbors, relatives)?
- Have you established a smoking ban or no smoking policy in the household?
- Does anyone smoke in childcare settings where the child stays?
- Describe the circumstances when your child may be exposed to smoke?

Possible Interventions:

- **Keep your home and car smoke-free**
- **Seek support to quit smoking, consider aids such as nicotine gum, patch, and medication from your doctor to help you in quitting**
- **Choose smoke-free childcare and social settings**
- Seek smoke-free environments in restaurants, theaters, and hotel rooms
- If you choose to smoke, do not smoke near your child

Follow-Up / Notes:

CIGARETTE SMOKE

Cigarette smoke contains a number of toxic chemicals and irritants. People with allergies may be more sensitive to cigarette smoke than others and research studies indicate that smoking may aggravate allergies.

Smoking does not just harm smokers but also those around them. Research has shown that children and spouses of smokers tend to have more respiratory infections and asthma than those of non-smokers. In addition, exposure to second-hand smoke can increase the risk of allergic complications such as sinusitis and bronchitis.

Common symptoms of smoke irritation are burning or watery eyes, nasal congestion, coughing, hoarseness and shortness of breath presenting as a wheeze.

Preventive Strategies

- Don't smoke and if you do, seek support to quit smoking. Contact Puff-Free Partners, such as:

National Cancer Institute
1-800-QUIT-NOW
http://www.smokefree.gov

Nicotine Anonymous
1-415-750-0328
http://www.nicotine-anonymous.org

American Lung Association
1-800-LUNG-USA
http://www.lungusa.org/ tobacco/index.html

Centers for Disease Control
1-800-CDC-1311
http://www.cdc.gov/tobacco/how2quit.htm

American Cancer Society
1-800-ACS-2345
http://www.cancer.org/tobacco

- Seek smoke-free environments in restaurants, theaters and hotel rooms.
- Avoid smoking in closed areas like homes or cars where others may be exposed to second-hand smoke.

NIEHS
National Institute of Environmental Health Sciences

http://www.niehs.nih.gov/health/topics/conditions/asthma/smoke.cfm

United States Environmental Protection Agency

ASTHMA HOME ENVIRONMENT

☑ CHECKLIST

Home visits provide an opportunity to educate and equip asthma patients with the tools to effectively manage their disease in concert with a physician's care. This checklist—designed for home care visitors—provides a list of questions and action steps to assist in the identification and mitigation of environmental asthma triggers commonly found in and around the home. The checklist is organized into three sections—building information, home interior and room interior. The room interior is further subdivided by categories (such as bedding and sleeping arrangements, flooring, window treatments, and moisture control). This will allow the home care visitor to focus on the specific activities or things in a room—in particular the asthma patient's sleeping area—that might produce or harbor environmental triggers. The activities recommended in this checklist are generally simple and low cost. Information on outdoor air pollution follows the checklist. The last page includes information on U.S. Environmental Protection Agency (EPA) resources and an area for the home care visitor to record a home visit summary.

If the patient's sensitivities to allergens (such as dust mites, pests, warm-blooded pets and mold) and irritants (such as secondhand smoke and nitrogen dioxide) are known, the home care visitor should begin by focusing on relevant areas. This checklist covers the following allergens and irritants, which are commonly found in homes. Information is also provided on chemical irritants—found in some scented and unscented consumer products—which may worsen asthma symptoms.

Dust Mites

Triggers: Body parts and droppings.

Where Found: Highest levels found in mattresses and bedding. Also found in carpeting, curtains and draperies, upholstered furniture, and stuffed toys. Dust mites are too small to be seen with the naked eye and are found in almost every home.

Pests (such as cockroaches and rodents)

Triggers: Cockroaches – Body parts, secretions, and droppings.
Rodents – Hair, skin flakes, urine, and saliva.

Where Found: Often found in areas with food and water such as kitchens, bathrooms, and basements.

Warm-Blooded Pets (such as cats and dogs)

Triggers: Skin flakes, urine, and saliva.

Where Found: Throughout entire house, if allowed inside.

Mold

Triggers: Mold and mold spores which may begin growing indoors when they land on damp or wet surfaces.

Where Found: Often found in areas with excess moisture such as kitchens, bathrooms, and basements. There are many types of mold and they can be found in any climate.

Secondhand Smoke

Trigger: Secondhand smoke – Mixture of smoke from the burning end of a cigarette, pipe or cigar and the smoke exhaled by a smoker.

Where Found: Home or car where smoking is allowed.

Nitrogen Dioxide (combustion by-product)

Trigger: Nitrogen dioxide – An odorless gas that can irritate your eyes, nose, and throat and may cause shortness of breath.

Where Found: Associated with gas cooking appliances, fireplaces, woodstoves, and unvented kerosene and gas space heaters.

BUILDING INFORMATION

(This information may be helpful to determine reasonable mitigations.)

What type of building does the patient live in?

- ☐ House
- ☐ Duplex
- ☐ Apartment
- ☐ Mobile home
- ☐ Other_____

Notes:

Does the patient own or rent?

- ☐ Own
- ☐ Rent

Notes:

Questions	Answers	Action Steps
HOME INTERIOR		▲ **MAY REQUIRE ADDITIONAL TIME AND/OR RESOURCES.**
Secondhand Smoke		
Does anyone smoke in the home or car?	☐ Y ☐ N	▪ Keep the home and car smoke-free. ▪ Do not allow visitors to smoke in the home. ▪ Take the smoke-free home pledge and post a smoke-free home decal or magnet to show that the house is a "smoke-free" zone.
Notes:		
Warm-blooded Pets (such as cats and dogs)		
Is the patient's asthma worse when around warm-blooded pets?	☐ Y ☐ N	▪ If possible, remove the pet from the home or keep the pet outside. ▪ If this is not possible, keep the pet out of the patient's sleeping area and off of the furniture.
Notes:		
Consumer Products		
Is the patient's asthma worse when around chemicals or products with strong odors (such as cleaners, paints, adhesives, pesticides, air fresheners, or cosmetics)?	☐ Y ☐ N	▪ Limit patient's exposure as much as possible by minimizing product use, using products only when patient is not present, or trying alternative products. ▪ If products are used, carefully follow manufacturer's instructions on the label and make sure the area is well ventilated.
Notes:		
Heating and Cooling Systems		
Does the heating and cooling system use filters?	☐ Y ☐ N	▲ If so, replace the filters quarterly. ▲ Use filters with higher efficiency than standard furnace filters, such as upgraded pleated filters, if heating or cooling system manufacturer's specifications allow.
Notes:		

Questions	Answers	Action Steps
HOME INTERIOR (continued)		▲ **MAY REQUIRE ADDITIONAL TIME AND/OR RESOURCES.**
Does the heating system use a fuel-burning appliance (such as an oil or gas furnace)? *Notes:*	☐ Y ☐ N	▲ Have the heating system - including furnaces, flues and chimneys - professionally inspected annually. ▲ Promptly repair cracks or damaged parts.
Are supplemental heating sources used? (Check all that apply) *Notes:*	☐ Fireplace ☐ Wood-burning stove ☐ Unvented kerosene or gas space heater ☐ Other_____	■ Properly ventilate the room where a fuel-burning appliance is used. Consider using appliances that vent to the outside whenever possible. ■ Never use a gas-cooking appliance as a heating source. ■ If using a fireplace, make sure it is properly vented to help ensure smoke escapes through the chimney. ■ If using a wood-burning stove, make sure that doors are tight-fitting. Use aged or cured wood only and follow the manufacturer's instructions for starting, stoking, and putting out the fire. ■ If using an unvented kerosene or gas space heater, follow the manufacturer's instructions for proper fuel to use and keep the heater properly adjusted.
Are there air conditioning window units? *Notes:*	☐ Y ☐ N	■ Run window air conditioner with the vent control open to increase the outdoor ventilation rate during the cooling season.
ROOM INTERIOR		
Bedding and Sleeping Arrangements		
What does the patient sleep on? (Check all that apply) *Notes:*	☐ Mattress with box springs ☐ Sofa ☐ Other_____	▲ Cover patient's mattress in a dust-proof (allergen impermeable) zippered cover. Clean cover according to manufacturer's instructions. ■ If it is necessary for the patient to sleep on upholstered furniture such as a sofa, then cover furniture with washable slipcovers or sheets and vacuum furniture regularly (including removing cushions and vacuuming in cracks and crevices).
What types of bedding does the patient use? (Check all that apply) *Notes:*	☐ Bedspread (e.g., comforter, quilt) ☐ Blankets ☐ Pillows ☐ Sheets ☐ Other (e.g., sleeping bag) _____	■ Choose washable bedding. ■ Wash bedding regularly in hot water and dry completely. ▲ Cover patient's pillow in a dust-proof (allergen impermeable) zippered cover. Clean cover according to manufacturer's instructions.

Questions	Answers	Action Steps
ROOM INTERIOR (continued)		▲ **MAY REQUIRE ADDITIONAL TIME AND/OR RESOURCES.**
Flooring		
What type of floor covering is present? (Check all that apply)	☐ Carpeting ☐ Hardwood floor, tile, or vinyl flooring ☐ Throw rugs ☐ Other_____	▪ If carpeting is present, vacuum carpets, area rugs, and floors regularly. ▪ If possible, use a vacuum cleaner with a high efficiency filter. ▪ Mop hard surface floors regularly. ▪ Wash throw rugs regularly in hot water. Dry completely. ▪ Clean baseboards regularly using a damp cloth with warm, soapy water. ▪ Someone besides the patient should vacuum, sweep, empty the dust canister and change the vacuum bag. ▪ If possible, the patient should stay out of rooms when they are being vacuumed or swept. ▪ If the patient vacuums, sweeps, empties the dust canister, or changes the vacuum bag, he or she should wear a dust mask.
Notes:		
Upholstered Furniture and Stuffed Toys		
Is there upholstered furniture present?	☐ Y ☐ N	▪ Cover upholstered furniture with washable slipcovers or sheets. ▪ Vacuum upholstered furniture regularly, including removing cushions and vacuuming in cracks and crevices. ▲ If replacing furniture, consider purchasing a non-upholstered furniture - such as vinyl, wood, or leather - that can be easily wiped down.
Notes:		
Are stuffed toys present?	☐ Y ☐ N	▪ Choose washable stuffed toys, and wash frequently in hot water. Dry completely. ▪ Limit the number of stuffed toys in patient's bed and sleeping area.
Notes:		
Window Treatments		
What window coverings are present? (Check all that apply)	☐ Curtains or drapes ☐ Blinds ☐ Shades ☐ Other_____	▪ Vacuum drapes regularly. ▪ Wash and dry curtains regularly. ▪ Dust window sills, blinds, and shades regularly using a damp cloth with warm, soapy water. Dry completely. ▲ If possible, replace curtains or drapes with plastic, vinyl, wood, or aluminum blinds.
Notes:		
Cooking Appliances		
Are gas cooking appliances used?	☐ Y ☐ N	▪ When cooking with a gas appliance, turn on an exhaust fan or open a window. ▪ Avoid misuse of the appliance by following the manufacturer's instructions for operation.
Notes:		

Questions	Answers	Action Steps
ROOM INTERIOR (continued)		▲ **MAY REQUIRE ADDITIONAL TIME AND/OR RESOURCES.**
Moisture Control		
Is there evidence of water damage, moisture, or leaks (such as damp carpet or leaky plumbing)? *Notes:*	☐ Y ☐ N	■ Dry damp or wet items within 24-48 hours to avoid mold growth. ▲ Fix water leaks (such as leaky plumbing) as soon as possible. ▲ Replace absorbent materials, such as ceiling tiles and carpet, if mold is present. ▲ Use air conditioner or dehumidifier to maintain low indoor humidity. If possible, keep indoor humidity below 60% (ideally between 30-50%) relative humidity.
Do you see or smell mold or mildew (such as in the bathroom on tub, shower, walls, or windows)? *Notes:*	☐ Y ☐ N	■ Open a window or turn on an exhaust fan when there is excessive moisture in the room, such as when showering or cooking. ■ Scrub mold off hard surfaces with detergent and water. Dry completely. ■ Clean up mold and dry surfaces completely before painting or caulking. ▲ Replace absorbent materials, such as ceiling tiles and carpet, if mold is present.
Is standing water present (such as in refrigerator drip pans, air conditioner drip pans, or house plants)? *Notes:*	☐ Y ☐ N	■ Empty and clean refrigerator and air conditioner drip pans regularly. ■ Avoid standing water in plant containers.
Are humidifiers used in the patient's house? *Notes:*	☐ Y ☐ N	■ Use humidifier only when conditions require it, use the correct setting to maintain indoor relative humidity between 30-50 percent, and clean humidifier reservoirs regularly. ■ Use low mineral content water to prevent the build-up of scale and dispersal of minerals into the air. ■ Follow manufacturer's instructions for use, maintenance, and replacement of any materials supplied with the humidifier.
Are rooms and moisture-producing appliances—such as stoves, clothes dryers, or dishwashers—properly vented (including venting to the outside if specified by the manufacturer)? *Notes:*	☐ Y ☐ N	■ Increase ventilation or air movement by opening doors and/or windows when practical. Use fans as needed. ■ Run the bathroom exhaust fan or open the window when showering. ■ Use exhaust fans or open windows whenever cooking or washing dishes. ■ Vent appliances properly according to manufacturer's specifications.

Questions	Answers	Action Steps
ROOM INTERIOR (continued)		▲ **MAY REQUIRE ADDITIONAL TIME AND/OR RESOURCES.**
Pest Control		
Is there evidence of cockroaches and/ or rodents (such as droppings or dead specimens in traps)?	☐ Y ☐ N	▪ Clean all surfaces where you have seen pests. ▪ Use poison baits, boric acid, or traps to kill pests. Minimize use of sprays. If sprays are used: limit the spray to the infested area, carefully follow the instructions on the label, make sure there is plenty of fresh air where the spray is being used and, if possible, keep patient out of the room.
Notes:		
Are there food crumbs or open or unsealed food?	☐ Y ☐ N	▪ Clean all food crumbs or spilled liquids right away. ▪ Store food in sealed containers. ▪ Remove food, bags, newspapers, and empty boxes, cans, and bottles from the sleeping area. ▪ Put all garbage in plastic trash bags. Seal trash bags and put them into garbage cans with fitted lids every day.
Notes:		
Are there holes or gaps between construction materials and pipes that could allow pests to enter the house?	☐ Y ☐ N	▪ Seal holes or gaps between construction materials and pipes, or ask the owner to do so.
Notes:		
Is there evidence of standing water or leaks?	☐ Y ☐ N	▪ Dry damp or wet items within 24-48 hours to avoid mold growth. ▪ Avoid standing water in house plant containers and drip pans. ▲ Fix water leaks (such as leaky plumbing) as soon as possible.
Notes:		

OUTDOOR AIR POLLUTION

Exposure to air pollution (mainly ozone and particle pollution) can trigger asthma attacks. The Air Quality Index (AQI) is a tool to provide the public with clear and timely information on local air quality and whether air pollution levels pose a possible health concern. The AQI is reported and forecasted every day in many areas throughout the U.S. on local weather reports and through national media. Asthma attacks are most likely to occur the day **after** outdoor pollution levels are high.

People can take simple steps to reduce their exposure to outdoor air pollution. When the AQI reports unhealthy levels:

- Limit physical exertion outdoors.
- Consider changing the time of day of strenuous outdoor activity to avoid the period when air pollution levels are high or consider postponing sports activities to another time.
- Reduce the intensity of the activity, or spend less time engaged in strenuous activities. For example, coaches can rotate players more frequently in strenuous sports, like soccer. Resting players reduces their exposure to air pollution.

To learn more about and access the AQI, visit www.epa.gov/airnow.

Educational Resources:

To learn more about EPA's programs on:

- Asthma and steps you can take to remove environmental triggers from the home, visit www.epa.gov/asthma.
- Secondhand smoke and how to make your home and car smoke-free, visit www.epa.gov/smokefree or call the smoke-free home pledge number at 1-866-SMOKE-FREE (1-866-766-5337).
- Household pest management and how to apply integrated pest management at home, visit www.epa.gov/pesticides/controlling/home.htm.

To order materials at no cost on:

- Asthma and secondhand smoke, call EPA's Indoor Air Quality Information Line at 1-800-438-4318.
- Household pest management, call EPA's National Center for Environmental Publications at 1-800-490-9198.

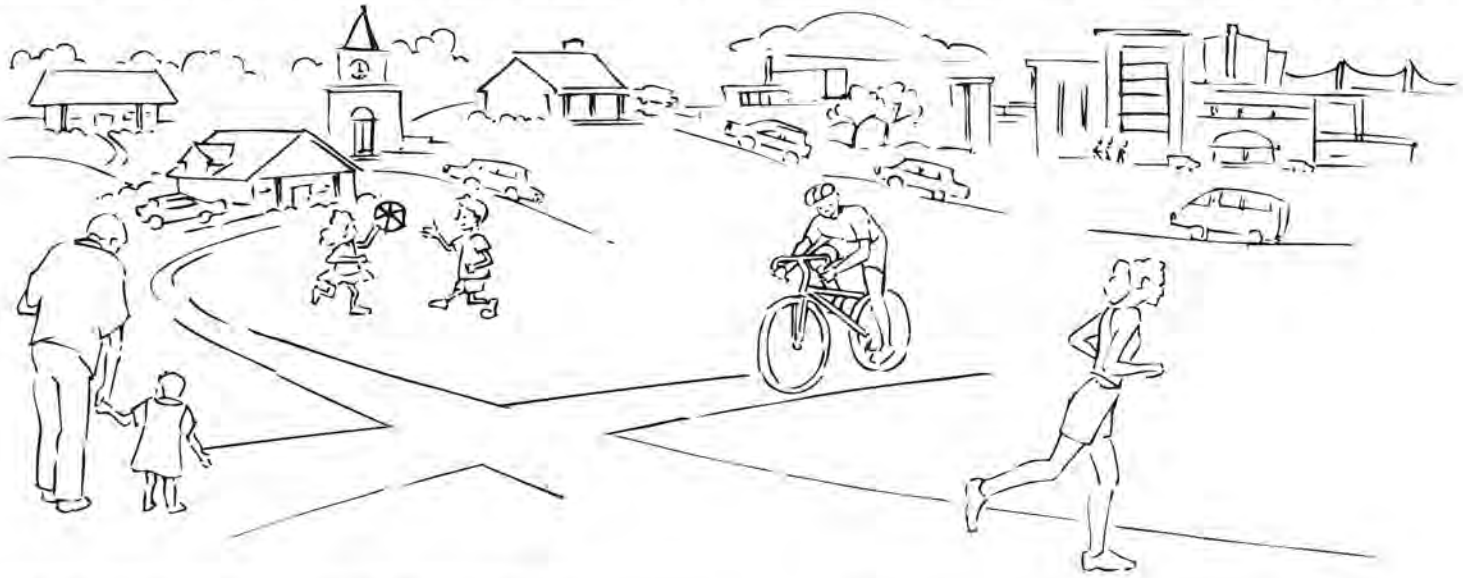
SUMMARY

Use this space to record triggers identified and mitigations recommended. You are encouraged to provide this information to the patient's health care provider.

EPA

CDC

ASTHMA AND OUTDOOR AIR POLLUTION



1 Air pollution can make asthma symptoms worse and trigger attacks.

If you or your child has asthma, have you ever noticed symptoms get worse when the air is polluted? Air pollution can make it harder to breathe. It can also cause other symptoms, like coughing, wheezing, chest discomfort, and a burning feeling in the lungs.

Two key air pollutants can affect asthma. One is *ozone* (found in smog). The other is *particle pollution* (found in haze, smoke, and dust). When ozone and particle pollution are in the air, adults and children with asthma are more likely to have symptoms.

2 You can take steps to help protect your health from air pollution.

► *Get to know how sensitive you are to air pollution.*

- Notice your asthma symptoms when you are physically active. Do they happen more often when the air is more polluted? If so, you may be sensitive to air pollution.
- Also notice any asthma symptoms that begin up to a day *after* you have been outdoors in polluted air. Air pollution can make you more sensitive to asthma triggers, like mold and dust mites. If you are more sensitive than usual to indoor asthma triggers, it could be due to air pollution outdoors.

► *Know when and where air pollution may be bad.*

- *Ozone* is often worst on hot summer days, especially in the afternoons and early evenings.
- *Particle pollution* can be bad any time of year, even in winter. It can be especially bad when the weather is calm, allowing air pollution to build up. Particle levels can also be high:
  - — Near busy roads, during rush hour, and around factories.
  - — When there is smoke in the air from wood stoves, fireplaces, or burning vegetation.

► ***Plan activities when and where pollution levels are lower.*** Regular exercise is important for staying healthy, especially for people with asthma. By adjusting when and where you exercise, you can lead a healthy lifestyle and help reduce your asthma symptoms when the air is polluted. In summer, plan your most vigorous activities for the morning. Try to exercise away from busy roads or industrial areas. On hot, smoggy days when ozone levels are high, think about exercising indoors.

► ***Change your activity level.*** When the air is polluted, try to take it easier if you are active outdoors. This will reduce how much pollution you breathe. Even if you can't change your schedule, you might be able to change your activity so it is less intense. For example, go for a walk instead of a jog. Or, spend less time on the activity. For example, jog for 20 minutes instead of 30.

► ***Listen to your body.*** If you get asthma symptoms when the air is polluted, stop your activity. Find another, less intense activity.

► ***Keep your quick-relief medicine on hand when you're active outdoors.*** That way, if you do have symptoms, you'll be prepared. This is especially important if you're starting a new activity that is more intense than you are used to.

► ***Consult your health care provider.*** If you have asthma symptoms when the air is polluted, talk with your health care provider.

- If you will be exercising more than usual, discuss this with your health care provider. Ask whether you should use medicine before you start outdoor activities.
- If you have symptoms during a certain type of activity, ask your health care provider if you should follow an asthma action plan.

3 Get up-to-date information about your local air quality:

Sometimes you can tell that the air is polluted—for example, on a smoggy or hazy day. But often you can't. In many areas, you can find air quality forecasts and reports on local TV or radio. These reports use the Air Quality Index, or AQI, a simple color scale, to tell you how clean or polluted the air is. You can also find these reports on the Internet at: *www.epa.gov/airnow.* You can use the AQI to plan your activities each day to help reduce your asthma symptoms.

4 For more information:

Air quality and health:

- EPA's AIRNow website at *www.epa.gov/airnow*
- Call 1-800-490-9198 to request free EPA brochures on: *Ozone and Your Health, Particle Pollution and Your Health, and Air Quality Index: A Guide to Air Quality and Your Health.*

Asthma:

- Centers for Disease Control and Prevention (CDC) Web site at *www.cdc.gov/asthma*

Indoor air and asthma:

- EPA's asthma website at *www.epa.gov/asthma*

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