



Healthy Indoor Air for America's Homes



Sources of information on asthma:

EPA Indoor Air Quality Information Clearinghouse: 1-800-438-4318

American Lung Association: 1-800-LUNG-USA

Asthma and Allergy Foundation of America: 1-800-7ASTHMA

Asthma & Allergy Network/ Mothers of Asthmatics: 1-800-878-4403

Sources of information on home indoor air quality:

County Extension Office: check your county government telephone listing

EPA Indoor Air Quality Information Clearinghouse: 1-800-438-4318

National Lead Information Center: 1-800-424-5323

Consumer Product Safety Commission: 1-800-638-CPSC

Healthy Indoor Air For America's Homes website: www.healthyindoorair.org

A partnership program of



United States Environmental Protection Agency
Indoor Environments Division



EXTENSION
Housing Program



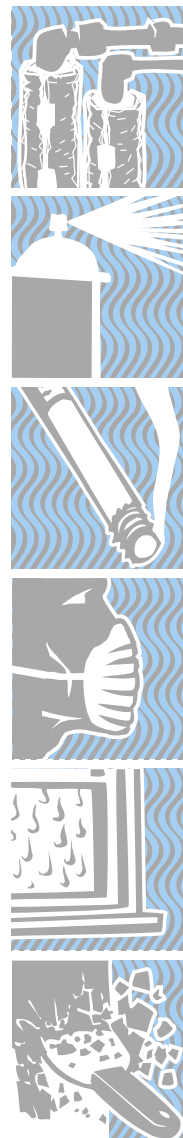
United States Department of Agriculture
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Healthy Indoor Air for America's Homes website:
www.healthyindoorair.org

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Healthy Indoor Air for America's Homes



Indoor Air Hazards Every Homeowner Should Know About...

Healthy Indoor Air for America's Homes is a national consumer education program concerned with improving the quality of indoor air in homes. The program offers nationwide education through state program managers and the development and distribution of educational resources, as well as a network of over 3000 county Cooperative Extension Service offices.

- The goal of Healthy Indoor Air for America's Homes is to educate consumers about sources, health risks and control measures related to common residential indoor air problems and help consumers reduce their risks from these problems.
- This program provides awareness of indoor air quality issues such as carbon monoxide and other combustion by-products, radon, secondhand smoke, molds, and other biologicals, formaldehyde, lead and air hazards associated with home remodeling and household products.
- Healthy Indoor Air for America's Homes is a partnership program of the Montana State University Extension Housing Program, the U.S. Environmental Protection Agency and the U.S. Department of Agriculture Cooperative State Research, Education and Extension Service.
- For more details and a list of state program managers, visit the website: www.healthyindoorair.org

Lead-Based Paint

- Paint manufactured before 1978 can contain lead.

Animals

- Leave allergens such as dander, hair, feathers and skin in the air.

Bedroom

Humidifier/Vaporizer (cold mist type)

- Can encourage the growth of mold and mildew, as well as cockroaches and infectious disease agents (viruses, bacteria).

Moth Repellents

- Often contain paradichlorobenzene, a pesticide.

Dry-cleaned Goods

- Organic gases are released from chemicals used in the cleaning process.

Smoke Detectors and Carbon Monoxide Alarms

- Install a smoke detector in the hallway adjacent to or located in each bedroom. If you have gas or other fossil-fuel burning appliances in the house, install carbon monoxide alarms in these locations as well. Combination smoke detectors and carbon monoxide alarms are available. (Remember to check the batteries frequently.)

Utility and Hobby Areas

Asbestos Pipe Wrap and Furnace Insulation

- Inspect for damage or deterioration; do not remove any asbestos-containing materials. Repair or removal by a professional is needed. Call EPA at (202) 554-1404 for more information.

Ground Moisture

- Encourages biological allergens like mold and mildew.

Radon

- An invisible, radioactive gas that poses a lung cancer risk.

Hobby Products

- Solvents, paint, glue, epoxy, etc.; organic gases are released from chemicals in products.

Wood Shop Hazards

- Wood dust and particles, adhesives and chemical finishes.

Unvented Clothes Dryer/Gas-Fired Clothes Dryer—See “Bathroom and Laundry”

Gas or other Fossil-Fuel Furnace/Boiler and Gas Water Heater

- Backdrafting carbon monoxide (CO) and combustion pollutants.

Garage

Car or Small Engine Exhaust

- Sources of carbon monoxide and combustion by-products.

Paint, Solvents and Cleaning Supplies

- May release harmful vapors.

Pesticides/Fertilizers

- Toxic yard and garden chemicals.

Stored Fuels

- Examples are gasoline, kerosene, etc.

*This assessment is not meant to be inclusive of all possible sources of indoor air quality pollutants. For more information, and to learn how to remedy the above situations, go to:

www.healthyindoorair.org

If you're like most Americans, you spend much of your time indoors. Have you ever stopped to think about whether the air you're breathing when indoors is healthy? This booklet can help you identify things in your home that may impact the quality of your indoor air and your health.

Research has found that in some homes across America, the quality of indoor air can be worse than outdoor air. In part, this is because many homes are being built and remodeled tighter.

You don't have to be a building scientist to deal with the quality of air in your home. However, you should understand a few basics to get you started. The “Healthy Indoor Air for America's Homes” project was developed to provide basic but comprehensive information to consumers to get a handle on indoor air quality.

A major hazard is MISINFORMATION. Be informed. Request more information by contacting the resources listed on the back of this booklet.

Signs of possible home indoor air quality problems:

- unusual and noticeable odors, stale or stuffy air
- noticeable lack of air movement
- dirty or faulty central heating or air conditioning equipment
- damaged flue pipes or chimneys
- excessive humidity or condensation
- tightly constructed or remodeled home
- presence of molds
- health reaction when inside the home, especially after remodeling, weatherizing, installing new furniture, using household or hobby products or moving into a new home
- feeling noticeably healthier outside the home

Room-by-room Assessment*

Kitchen

Moisture from Cooking and Dishwasher Use

- ❑ Encourages the growth of mold, and mildew, as well as cockroaches and dust mites.

Household Cleaners

- ❑ Harmful vapors!

Pressed-Wood Cabinets

- ❑ Can be a source of formaldehyde vapor.

Unvented Gas Stove and Range

- ❑ A source of carbon monoxide and combustion by-products.

Bathroom and Laundry

Moisture from bathing, clothes washing, etc.

- ❑ Encourages the growth of mold and mildew, as well as cockroaches and dust mites; creates potentially damaging condensation.

Personal Care Products

- ❑ Organic gases are released from chemicals in products.

Air Freshener

- ❑ Organic gases are released from chemicals in products.

Unvented Clothes Dryer

- ❑ Produces excessive moisture and dust. Moisture encourages biological pollutants.

Gas-Fired Dryer

- ❑ Produces carbon monoxide and combustion by-products and a fire hazard.

Living Areas

Paneling, Pressed-Wood Furniture and Cabinetry

- ❑ May release formaldehyde gas.

Carpets

- ❑ Biological pollutants can grow on water-damaged carpet; organic gases from new carpet.

Floor Tiles

- ❑ Some contain asbestos.

House Dust Mites

- ❑ Biological allergens can trigger asthma episode.

Air Conditioner

- ❑ Biological allergens.

Fireplaces

- ❑ Carbon monoxide and combustion pollutants.

Moisture

- ❑ Encourages the growth of mold and mildew, as well as dust mites and cockroaches.

Gas or Kerosene Space Heater

- ❑ Carbon monoxide and combustion pollutants.

Secondhand Smoke (Environmental Tobacco Smoke)

- ❑ Contains harmful combustion and particulate pollutants including carbon monoxide and combustion by-products.

Draperies

- ❑ May be treated with a formaldehyde-based finish and emit odors for a short period of time.

Q: If I have a child with asthma, what can I do to reduce further asthma episodes from occurring?

A: Effectively managing a child’s asthma can best be accomplished by working with your doctor to develop a plan that includes the use of medications and avoidance of environmental triggers. Since children spend most of their time in schools, day care facilities or at home, it is important to reduce their exposure to environmental asthma triggers as much as possible in each of these environments.

Animal dander: It is best not to have furry pets. If present, try to keep them out of areas where children spend a lot of time. Keep pets out of carpeted areas.

Cockroaches: To manage a cockroach problem, water and food sources must be controlled. Store food in tightly sealed containers, clean up scraps and crumbs promptly. Do not leave food, water or garbage exposed.

Dust mites: Dust mites live in mattresses, pillows, carpets, fabric-covered furniture, bed covers, clothes, and stuffed toys. Cover mattresses and pillows in dust-proof (allergen-impermeable) zippered covers. Wash bedding (such as sheets, bedcovers and blankets) once a week in hot water. Choose washable stuffed toys, wash them often in hot water, and dry thoroughly. Keep stuffed toys off beds.

Mold: Fix water problems and leaks promptly (within 24 to 48 hours). Thoroughly dry wet areas to prevent mold growth. Clean up hard, moldy surfaces with water and detergent, then dry thoroughly. Porous items may need to be discarded.

Secondhand smoke: Do not allow smoking in your home or in the car. Request that the smoker smoke outside.

Indoor air hazards you should know about:



Biological Pollutants (like molds, animal dander, cockroaches and dust mites) ... 4
Sources include excessive humidity levels, poorly-maintained humidifiers and air-conditioners, inadequate ventilation and animal dander.



Unhealthy Remodeling By-products 6
Sources include materials such as:
• asbestos,
• lead,
• formaldehyde, and
• other hazardous materials disturbed during remodeling activities.



Combustion Products, including carbon monoxide..... 9
Sources include unvented fossil-fuel space heaters, unvented gas stoves and ovens, decorative gas logs, and “backdrafting” from furnaces, fireplaces and water heaters.



Lead Dust..... 11
Sources include lead-based paint dust from removing paint by sanding, scraping and burning.



Secondhand Smoke 13
Sources include sidestream and exhaled smoke from burning tobacco products.



Radon 15
This is a radioactive gas from soil and rock beneath and around the foundation, ground water wells and some building materials.



Household Products: How to safely choose and use 16
Sources include cleaning products, paints, air fresheners, hobby supplies, dry cleaned clothing, aerosol sprays, adhesives that contain formaldehyde, and fabric additives used in carpeting and furniture.

Asthma triggers include secondhand smoke, dust mites, pets, molds and pests such as cockroaches and rodents..... 17

Room-by-room Assessment 19



Biological Pollutants (like molds and dust mites)

Q: What biological problems should I be concerned about?

A: Molds, cockroaches and dust mites are common biological pollutants. Molds are often found in damp or wet areas of the home such as bathrooms, kitchens, laundry rooms or basements. Dust mites can be found in mattresses, pillows, carpets, etc. Cockroaches are attracted to areas where food and water are available.

Q: What are some of the health effects?

A: Allergic reactions are common health problems associated with biological pollutants. Symptoms often include watery eyes, runny nose and sneezing, nasal congestion, itching, coughing, wheezing and difficulty breathing, and headache. Dust mites, molds and cockroaches are known to trigger asthma episodes.

Q: How are biological contaminants transported through the house?

A: Molds and dust mites thrive in areas of excessive moisture. Mold grows on organic materials such as paper, textiles, grease and soap scum. Mold spores float throughout the house, forming new colonies if they land on something damp or wet. Dust mites thrive on dead human skin cells and in textiles such as bedding, carpeting and upholstery. When these textiles are disturbed during vacuuming, making beds or walking on carpet, particles become airborne. Animal dander as well as pollen and plant material that enter through open windows or on pets and clothing may become airborne when disturbed.

Q: If I'm concerned about the biological contaminants in my home, what can I do to control the problem?

A: There are no practical tests for biological contaminants for use by non-professionals. However there are signs to watch for. You can sometimes see and smell mold. Mold growth should be suspected wherever there are water stains, standing water or moist surfaces. Prevent mold growth by keeping basements, bathrooms and other rooms clean and dry. Clean up mold on hard surfaces with detergent and water and dry completely. Absorbent or porous materials that are moldy may have to be discarded. Mold can grow on and fill in spaces in porous materials so that they are difficult or impossible to clean. Also, find and fix the water problem!

Humidifiers, dehumidifiers and air conditioning condensing units should be regularly cleaned. Eliminating water problems and reducing humidity

products also have pollution potential if not used correctly. Products may be labeled “environmentally safe,” but any product that evaporates into the air has the potential to be an indoor air pollutant, depending on the quantity used, the method of use, the product’s toxicity and the sensitivity of the user.



Asthma

Q: What is asthma?

A: Asthma is a long-term, inflammatory lung disease in which the airways of the lung tighten and constrict, causing wheezing, breathlessness, chest tightness and coughing. These symptoms can be at least partly reversed, either spontaneously or with treatment. Asthma also causes the airways of the lung to become especially sensitive to a variety of asthma triggers. In addition, the particular trigger or triggers and the severity of symptoms can differ for each person with asthma.

Q: How serious a health problem is asthma in the United States?

A: If you or your child has asthma, you are not alone. Twenty million Americans of all ages and races have asthma. Over 5 million children have asthma, and the percentage of children with asthma is rising more rapidly in preschool-aged children than in any other age group. Asthma is the leading cause of school absenteeism due to a chronic illness, accounting for over 14 million missed school days per year. Asthma can lead to many nights of interrupted sleep, limitation of activity, and disruptions of family and care-giver routines. Asthma symptoms that are not severe enough to require a visit to an emergency room or to a physician can still be serious enough to prevent a child with asthma from living a fully active life.

Q: What causes asthma?

A: Asthma is a complex issue. Research suggests that a combination of family history and environmental factors may cause asthma, but no one knows why children or adults develop asthma. However, there is a wealth of information to help people effectively manage their asthma. It is important for people with asthma to learn what triggers their asthma episodes and to avoid exposure to the particular trigger or triggers. Since Americans spend up to 90 percent of their time indoors, exposure to indoor allergens and irritants may play a significant role in triggering asthma episodes. Some of the most common asthma triggers found indoors include animal dander, cockroaches, dust mites, mold and secondhand smoke. Other asthma triggers include: respiratory infections, pollens (trees, grasses, weeds), outdoor air pollution, food allergies, exercise and cold air exposure.



Safely Choose and Use Household Products

The unsafe use of many common household products can cause many undesirable health effects. To protect yourself and your family, read on.

Q: What are some of the products I should be aware of?

A: Solvents, paints and other coatings, paint strippers, wood preservatives, aerosol sprays, moth repellents, air fresheners, stored fuels, automotive products, hobby supplies, pesticides, cleaners and disinfectants.

Q: What particular ingredients should I be concerned about?

A: The products to watch for are those containing volatile organic compounds, which are organic solvents that easily evaporate into the air. Some may be flammable. Following are some of the potentially hazardous compounds listed on product labels: petroleum distillates, mineral spirits, chlorinated solvents, carbon tetrachloride, methylene chloride, trichloroethane, toluene and formaldehyde. Other household product ingredients can also be a hazard if they are used improperly.

Q: What are some of the health effects?

A: Exposure to some household products may cause eye, nose and throat irritation, nausea, dizziness, loss of coordination or headaches. Some products have also been associated with liver, kidney or central nervous system damage and cancer.

Q: What are some ways I can minimize potential health problems?

A: First, read the labels of products you are considering buying. Note the product's ingredients and beware of any warnings of its use. Always use household products only for their intended purpose and according to the manufacturer's instructions. Use the product in a well-ventilated area. Choose products that are packaged to reduce the chance of spills, leaks and child tampering. Also, keep household products in their original containers so that safety information and directions for use are always with the product.

Q: Are there ways I can reduce my need for these products?

A: Yes, by practicing preventative maintenance. Quickly attend to spills and stains. Remove food wastes promptly. Also, control excess moisture (such as standing water from air conditioner drains or refrigerator drip pans) and fix leaks, drips and seepage problems.

You might consider using “natural” or “alternative” products, but these

will help reduce biological contaminants such as molds, cockroaches and dust mites. Keep humidity at acceptable levels (less than 60 percent; ideally 30 to 50 percent) and make sure there's plenty of ventilation, especially in areas where moisture tends to build up. People who are sensitive to dust mites should consider using dust-proof mattress and pillow covers, wash sheets and blankets weekly in hot water. They may need to replace carpeting in their homes with hard surfaced flooring and use area rugs that can be removed and cleaned.

Vacuums with higher efficiency filters or central vacuum systems may help reduce the airborne dust generated by vacuuming.

Q: How do I clean up mold?

According to the U.S. Environmental Protection Agency (EPA), if the moldy area is less than about 10 square feet (less than roughly a 3 ft. by 3 ft. patch), in most cases, you can handle the job yourself, following the guidelines below. However:

- If there has been significant water damage, and/or mold growth covers more than 10 square feet, consult the U.S. Environmental Protection Agency (EPA) guide: Mold Remediation in Schools and Commercial Buildings. It is available free by calling the EPA Indoor Air Quality Information Clearinghouse at (800) 438-4318, or on the internet at: www.epa.gov/iaq/molds/mold_remediation.html.
- If you choose to hire a contractor to do the cleanup, make sure the contractor has experience cleaning up mold. Check references and ask the contractor to follow the recommendations in EPA's Mold Remediation in Schools and Commercial Buildings, the guidelines of the American Conference of Governmental Industrial Hygienists (ACGIH), or other guidelines from professional or government organizations.
- If you have health concerns, consult a health professional before starting cleanup.

For do-it-yourself clean-up, note that the use of a disinfecting chemical or biocide that kills organisms such as mold (chlorine bleach, for example) is not recommended as a routine practice during mold remediation, although there may be instances where professional judgement may indicate its use (for example, when immune-compromised individuals are present). In most cases, it is not possible or desirable to sterilize an area; background levels of mold spores will remain —**these spores will grow if the moisture problem has not been resolved**. If you choose to use disinfectants or biocides, always ventilate the area. Outdoor air may need to be brought in with fans. Never mix chlorine bleach solution with other cleaning solutions or detergents that contain ammonia because toxic fumes could be produced.

In instances when a biocide is NOT used, simply damp-wipe surfaces with plain water or with water and detergent solution (except wood – use wood floor cleaner); scrub as needed. Always dry completely after cleanup is completed.

In order to limit your exposure to airborne mold during cleanup, you should wear an N-95 respirator, available at many hardware stores. In order to be effective, the respirator or mask must fit properly, so carefully follow the instructions supplied with the respirator.



Unhealthy Construction and Remodeling By-Products

Asbestos • Lead-based Paint (see p. 11 for details)
Formaldehyde • Volatile Organic Compounds

You may not have realized that your remodeling project may be creating unhealthy household air.

Q: What remodeling hazards should I be concerned about?

A: Asbestos, formaldehyde and leaded paint dust are the main ones. These hazardous materials can be released into the air when you remove paint, hang cabinets or disturb other existing products that contain these materials. Paints, stripping and finishing products, and adhesives containing volatile organic compounds can also create indoor air pollution.

Q: By remodeling with products that don't include these hazardous materials, won't that minimize my exposure?

A: Not necessarily. Lead and asbestos were commonly used in home building until the late 1970s. Remodeling or attempting to remove these materials from a building can actually increase your risk of exposure. Often it's better to leave the lead- or asbestos-containing materials in place, but cover or seal them to reduce exposure. If you suspect these materials are in your home, seek professional help before remodeling. If you remodel, remember that thorough clean-up is important to control exposure.

Q: Where does asbestos come from? Why should I be concerned?

A: Major sources of asbestos are deteriorating, damaged or disturbed asbestos-containing insulation, fireproofing or acoustical materials, and floor tiles. In isolated cases, asbestos could be found in vermiculite attic insulation. Exposure to asbestos in the air during renovation or maintenance on asbestos containing materials may cause irritation reactions. Asbestos can



Radon

A naturally occurring radioactive gas

Q: What is radon? Where does it come from?

A: Radon is an odorless radioactive gas that results from the breakdown of uranium. Uranium is present in most of the soil and rock around the world. It is typically concentrated in areas with lots of granite, shale, phosphate and pitchblende.

Q: Why should I be concerned about radon?

A: Exposure to radon can increase your chances of getting lung cancer. Scientists are more certain about radon risks than risks from most other cancer-causing substances. Smoking combined with radon exposure is an especially dangerous health risk.

Q: How does radon affect my health?

A: Radon gas decays into radioactive particles that can be drawn into your lungs when you breathe. These particles release bursts of energy that can damage lung tissue and lead to lung cancer.

Q: How does radon enter your home?

A: Because radon is a gas, it can leak into your house through the basement or crawl space—via adjacent or exposed soil and rock—or through well water. Some building materials such as natural stone or rock can contain and emit radon. Radon can also be carried into your house through natural gas.

Q: How do I know if my home has significant concentrations of radon?

A: The only way to know is to have your home tested. You may be able to hire a radon monitoring service—check your yellow pages under “radon” or “labs.” You can also monitor radon levels yourself by using an alpha track detector, which takes at least a month—up to a year for more accurate readings—to determine average radon concentration. Such detectors cost about \$20-\$25 per kit which usually include postage and reporting on test results. Because these long-term tests are exposed to radon for a longer period, they are generally considered more representative than the short-term carbon detector tests. These can be conducted in two to seven days and cost \$10-\$20 per kit.

secondhand smoke increases the number of episodes and severity of symptoms in 400,000 to 1,000,000 children with asthma. Moreover, secondhand smoke is a risk factor for new cases of asthma in children who have not previously exhibited asthma symptoms.

In addition, EPA found that an estimated 700,000 to 1.6 million physician office visits per year for children under 3 years of age (with middle ear infections) can be attributed to exposure of secondhand smoke. Other findings of the dangers of secondhand smoke include:

- low birth weight—9,700 to 18,600 cases per year;
- Sudden Infant Death Syndrome (SIDS)—an estimated 1,900 to 2,700 deaths per year are linked to Environmental Tobacco Smoke (ETS);
- Heart disease—in adults, between 35,000 and 62,000 deaths per year.

Q: What can I do to reduce my family's risk from secondhand smoke?

A: Do not smoke in your home or car or permit others to do so. If a family member insists on smoking indoors, increase ventilation in the area where smoking takes place. Open windows or use exhaust fans. Do not smoke if children are present, especially infants and toddlers. They are particularly susceptible to the effects of passive smoking.

Q: Where can I get more information?

A: Contact your local Extension Office, your state department of health, or the National Indoor Air Quality Information Clearinghouse (1-800-438-4318). Other agencies with information are:

- Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion: (800) CDC-1311
- National Cancer Institute: 800-4-CANCER
- National Heart, Lung, and Blood Institute: 301-592-8573
- National Institute for Occupational Safety and Health: 1-800-35-NIOSH
- U.S. Environmental Protection Agency, <http://www.epa.gov/smokefree>

also cause cancer and chronic lung diseases. Smokers are at higher risk of developing asbestos-induced lung diseases. If you need to work on or remove asbestos containing materials, use a professionally certified contractor.

Q: What should I do if I have vermiculite attic insulation?

According to the U.S. Environmental Protection Agency's recommendations, DO NOT DISTURB IT. Any disturbance has the potential to release asbestos fibers into the air. Limiting the number of trips you make to your attic and shortening the length of those trips can help limit your potential exposure.

EPA and ATSDR (Agency for Toxic Substances and Disease Registry) strongly recommend that:

- Vermiculite insulation be left undisturbed in your attic. Due to the uncertainties with existing testing techniques, it is best to assume that the material may contain asbestos. Limit trips to the attic, if possible.
- You should not store boxes or other items in your attic if retrieving the material will disturb the insulation.
- Children should not be allowed to play in an attic with open areas of vermiculite insulation.
- If you plan to remodel or conduct renovations that would disturb the vermiculite, hire professionals trained and certified to handle asbestos to safely remove the material.
- You should never attempt to remove the insulation yourself. Hire professionals trained and certified to safely remove the materials.

Q: Where does formaldehyde come from? Why should I be concerned?

A: Formaldehyde is an important industrial chemical used to make other chemicals, building materials and household products. It is used in glues, pressed-wood products (such as plywood and particle board), preservatives, permanent press fabrics, paper product coatings, and certain insulation materials. Burning of some fuels can produce formaldehyde as a by-product.

Formaldehyde causes eye, nose and throat irritations, wheezing and coughing, fatigue, skin rashes, headaches, loss of coordination, nausea, damage to liver, kidneys and the central nervous system, and severe allergic reactions. It has been linked to cancer.

Q: How can I detect whether my home has significant concentrations of formaldehyde?

A: You may be able to detect it by its odor. Also, environmental testing firms, listed in the yellow pages of the phone directory, should be able to test for formaldehyde levels. Since such tests are costly, you should learn whether your home has possible sources of formaldehyde. Also, do-it-yourself test kits are available, but there is some question about their accuracy.

Q: What can I do to reduce formaldehyde problems?

A: In most cases, formaldehyde does not penetrate completely sealed plastic laminate and is at least partly blocked by coatings. Varnishes and special formaldehyde sealants are also available. Apply these coatings to all exposed edges and surfaces, such as the undersides of countertops, cabinet interiors and drawers.

High humidity and elevated temperatures cause formaldehyde release, so you might want to control humidity through air conditioning and properly used and maintained dehumidifiers. Also, increase ventilation, particularly after bringing new sources of formaldehyde into the home. When remodeling and in new construction, select low formaldehyde materials.

Q: What about other chemical products used in remodeling, such as paints, wood strippers and finishes, adhesives, waxes and cleaners?

A: The products to watch for are those containing volatile organic compounds, which are organic solvents that easily evaporate into the air. Some may be flammable. Following are some of the potentially hazardous compounds listed on product labels: petroleum distillates, mineral spirits, chlorinated solvents, carbon tetrachloride, methylene chloride, trichloroethane, toluene and formaldehyde. Other remodeling products can be hazardous if they are used improperly.

- Keep play areas clean. Wash bottles, pacifiers, toys and stuffed animals regularly.
- Keep children from chewing window sills or other painted surfaces.
- Clean or remove shoes before entering your home to avoid tracking in lead from soil.
- Make sure children eat nutritious, low-fat meals high in iron and calcium, such as spinach and dairy products. Children with good diets absorb less lead.



Secondhand Smoke

Here are some common questions and answers about secondhand smoke, also known as environmental tobacco smoke (ETS).

Q: What is secondhand smoke?

A: Secondhand smoke is a mixture of the smoke given off by the burning end of a cigarette, pipe or cigar, and the smoke exhaled from the lungs of smokers. Exposure to secondhand smoke is called involuntary smoking, or passive smoking.

Q: How does secondhand smoke affect my health?

A: Secondhand smoke has been classified by the U.S. Environmental Protection Agency (EPA) as a known cause of lung cancer in humans (Group A carcinogen). In 2000, the National Institutes of Health formally listed secondhand smoke as a known carcinogen in its 9th Report on Carcinogens. Secondhand smoke is estimated by EPA to cause approximately 3,000 lung cancer deaths in nonsmokers each year.

Q: What about the risks to children?

A: Secondhand smoke is a serious health risk, particularly to children. EPA estimates that secondhand smoke is responsible for between 150,000 and 300,000 lower respiratory tract infections in infants and children under 18 months of age annually, resulting in up to 15,000 hospitalizations each year. Children exposed to secondhand smoke are also more likely to have reduced lung function and symptoms of respiratory irritation like cough, excess phlegm and wheeze.

Passive smoking can lead to increased risk of fluid buildup in the middle ear, the most common cause of hospitalization of children for an operation. Children with asthma are especially at risk. EPA estimates that exposure to

Q: How do I know if my children have been exposed to lead?

A: If you live in an older home, your children may be at high risk. All children up to age 6 should be tested for lead in their blood. Ask your public health department about lead testing programs for children.

Q: How do I know if my home has significant concentrations of lead?

A: An estimated 57 million U.S. homes have at least some lead paint. Older homes are at greater risk. Prior to 1950, paint contained as much as 50 percent lead. Paint in good condition poses little risk. Paint that is peeling or on deteriorating surfaces is especially risky. Dust created from remodeling an older home can also be a source of lead.

Do-it-yourself test kits are available at home centers, paint stores and ceramic supply stores. However, their sensitivity is limited. Also, it may be difficult to get accurate readings on surfaces with multiple levels of paint. For more accurate information, have a professional detection service conduct a lead-based paint risk assessment.

Q: Should I be concerned if my home has lead?

A: Yes, especially if you live in a house built prior to 1978 that has not been determined to be lead free by a certified professional, and if you have young children in your home. But, it's important to distinguish between the presence of lead paint and a lead paint hazard. Lead paint in good condition may not pose a hazard until sometime in the future—say, if you plan to scrape the paint or remodel. Then paint dust will pose a hazard.

Q: If lead is detected in my home, what should I do?

A: If you suspect that your house has lead hazards, you can take some immediate steps to reduce your family's risk:

- If you rent, notify your landlord of peeling or chipping paint.
- Clean up paint chips immediately. Do not vacuum (vacuuming can disperse lead particles) or dry sweep.
- Clean floors, window frames, window sills and other surfaces weekly. Use a mop, sponge, or paper towel with warm water and a general all-purpose cleaner or a cleaner made specifically for lead. **REMEMBER: Never mix ammonia and bleach products together, since they can form a dangerous gas.**
- Thoroughly rinse sponges and mop heads after cleaning dirty or dusty areas.
- Wash children's hands often, especially before they eat and before nap time and bed time.



Combustion Pollutants (including Carbon Monoxide)

To protect yourself and your family from combustion pollutants, you need to know whether you're at risk. Here are some common questions and answers.

Q: What are combustion pollutants?

A: They include gases, particles and excess water vapor produced as a by-product of burning fuels such as natural gas, propane, wood, oil, kerosene, coal and tobacco. The resulting harmful gases include carbon monoxide, nitrogen dioxide and sulfur dioxide, as well as particulates and excess water vapor.

Q: Why should I be concerned about them?

A: Under certain conditions, such combustion pollutants can cause adverse health effects. Carbon monoxide, an odorless gas, can be fatal. Nitrogen dioxide can damage the respiratory tract and sulfur dioxide can irritate the eyes, nose and respiratory tract. Smoke and particulates irritate the eyes, nose and throat, and may exacerbate chronic respiratory illnesses such as asthma. They also have been associated with cancer. Too much water vapor can lead to moisture problems in the home, including the growth of mold.

Q: How do combustion pollutants get into the home?

A: Combustion pollutants enter the home from a variety of sources. Unvented or improperly maintained or installed vented cooking and heating appliances that burn fuels—furnaces, boilers, water heaters, fireplaces, stoves, space heaters, ranges and clothes dryers—can introduce combustion pollutants. These pollutants also are caused by tobacco smoking, automobile exhaust entering from a garage, and activities involving the use of internal combustion engines or burning, welding or soldering.

Q: What causes combustion gases (including carbon monoxide) to build to dangerous levels?

Harmful build-ups of these gases can occur when exhaust from combustion equipment is not properly vented or used, is not in good working order and is not regularly inspected for safe operation.

Some homes may have a problem with “backdrafting.” That’s when the air pressure inside the home is less than the air pressure outside, causing combustion by-products from furnaces, water heaters, fireplaces and similar equipment to spill back into the room rather than being vented outside. (Sometimes flue gases can be drawn back into the home when several sources are being exhausted at once.) Backdrafting can also occur when natural draft appliance exhaust is pulled back into the house by mechanical

ventilation—like a down-draft kitchen power vent. Tobacco smoking inside the home also contributes.

Q: How can I determine if combustion pollutants are affecting my health?

A: They may be the culprit if fuel-fired combustion appliances are being used and you feel bad only when you're inside the home and the symptoms disappear when you leave, or if more than one person in the home has similar symptoms. A noticeable increase in moisture problems can also be a sign of combustion pollutants in the home.

Q: How can I reduce the risk from combustion gases?

A: The most important practice is to keep all combustion equipment well-maintained and inspected for safety. Experts recommend having your combustion heating systems inspected by a trained professional every year. Such inspections should look for blocked openings to flues and chimneys, cracked or disconnected flue pipe, dirty filter, rust or cracks in the heat exchanger, soot or creosote build-up, and exhaust or gas odors. Also, always operate combustion equipment for its intended purpose and make sure it has been installed correctly. Consider using vented appliances whenever possible. You should install a carbon monoxide alarm, which will alert you to dangerous levels of carbon monoxide—though not detect other combustion by-products. Choose one wisely and keep it in good working order.

Q: What signs can help me determine if carbon monoxide is affecting my health?

A: Carbon monoxide may be the problem if you feel bad only when you're inside the home and the symptoms gradually disappear after you have left, or if more than one person in the home has similar symptoms. Remember carbon monoxide related symptoms are similar to those of the flu. Carbon monoxide bonds tightly to the hemoglobin in red blood cells, preventing them from carrying oxygen throughout the body. Levels of carbon monoxide that can result from common household sources may cause nausea, dizziness, muscle aches, vomiting, and a general weakness throughout the body. These symptoms resemble the flu or food poisoning, and carbon monoxide exposure is often mistaken for these illnesses. Larger carbon monoxide doses can impair judgment, or the weakness becomes paralysis, which can be followed by coma or death.

Carbon monoxide victims must be removed from exposure as quickly as possible and require prompt medical attention. Because of the tight bond of carbon monoxide to hemoglobin, recovery is not immediate when the victim is removed from exposure.

Carbon monoxide will usually affect all occupants of a household at the

same time. This may be a good way of distinguishing it from the flu, but it is important to realize that carbon monoxide poisoning also impairs judgment and such a realization may become difficult to attain.

Q. Is there a way to detect if my home has carbon monoxide build-up?

A. Carbon monoxide alarms are widely available and should be considered a back-up to BUT NOT A REPLACEMENT for proper installation, use, and maintenance of fuel-burning appliances. Carbon monoxide alarms are designed to warn you of any unusual build-up of carbon monoxide in your home. These higher levels of carbon monoxide may occur from improperly maintained, installed or used fuel-burning appliances, backdrafting appliances or fireplaces, or idling cars in garages. If a carbon monoxide alarm is to be installed:

1. Make sure the device is certified to the most current Underwriters Laboratory (UL) standard 2034 or the International Approval Services (IAS) 6-96 standard.
2. Install a CO alarm in the hallway near every separate sleeping area.
3. Be aware of all instructions and warnings associated with the CO alarm.
4. If battery-operated, install new batteries annually.



Lead Dust

Q: What is lead? What are the sources of lead?

A: Lead is a metallic element that is widely dispersed in the environment. It was used in house paint until 1978, when it was banned. It was also widely used in gasoline, but has since been removed. Near major traffic corridors, soils may be contaminated from the long-term use of leaded gas. Also, water is a potential source of lead. This is usually from lead in solder, fixtures and piping in the home. There is no lead in a “lead” pencil!

Q: Why should I be concerned about lead?

A: Young children (up to about 6 years old) are especially at risk of ingesting lead-contaminated dust or paint chips. Small amounts of lead dust, consumed regularly, can cause delayed development, reading and learning problems, lowered IQ, hyperactivity and discipline problems. Larger doses can cause high blood pressure, anemia, and kidney and reproductive disorders. Lead accumulates in the body and its effects are irreversible.