Indoor Air Hazards

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Fact Sheet

Indoor Air Hazards

Studies from the United States and Europe show that, on average, persons in industrialized nations spend more than 90 percent of their time indoors. For infants, the elderly, persons with chronic diseases, and most urban residents of any age, the proportion is probably higher. The amount of time spent indoors is important because the concentration of many pollutants exceeds those outdoors. The locations of highest concern are those involving prolonged, continuing exposure – that is, the home, school, and workplace. Many of the common pollutants found in the home can be reduced with careful planning and good home maintenance.

Biological Pollutants

Biological pollutants include such things as molds and dust mites. Mold are plant-like organisms that produce spores that float in the air like pollen. Mold is found in areas of the home that have high humidity levels, such as bathrooms, kitchens, laundry rooms and basements. Dust mites are tiny organisms not commonly visible to the naked eye. They feed off human and animal dander. Their waste becomes airborne during vacuuming, bed making, or when textiles are disturbed. Dust mites are second only to pollen in causing allergic reactions.

Health Concern

Allergic reactions are the most common health problems associated with biological pollutants. Symptoms often include watery eyes, runny nose and sneezing, nasal congestion, itching, coughing, wheezing and difficulty breathing, headache, dizziness and fatigue.

Molds and dust mites thrive in areas of high humidity. Molds grow most places but especially on organic materials such as food, paper, textiles, grease, dirt and soap scum. Mold spores float throughout the house, forming new colonies where they land. Dust mites thrive on human and animal dander, dead skin cells especially in textiles such as bedding, carpeting and upholstery.

Reduce the Risk

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 colonies growing on surfaces. Mold growth should be expected wherever there are water stains, standing water or moist surfaces for more than a day.

Prevent mold growth by keeping basements, bathrooms and other rooms clean and low humidity. Use a disinfectant to clean surfaces that have mold on them. When carpeting or uphostered furniture become wet, they must be quickly and thoroughly dried or discarded.

Humidifiers, dehumidifies and air conditioning condensing units should be regularly cleaned with a disinfectant such as chlorine bleach.

Keep humidity at acceptable levels (less than 50 percent) by making sure that water vapor from baths and cooking is exhausted to the exterior and ventilation is used to control indoor moisture in the air.

People who are sensitive to dust mites may need to replace carpeting in their homes with hard-surfaced flooring and use area rugs that can be removed and cleaned.

Vacuums with high-efficiency filters, water filtration systems or central vacuum systems can help reduce the airborne dust generated by vacuuming.

Carbon Monoxide

Carbon monoxide is an odorless, colorless gas that can be fatal when breathed. It is produced when combustion equipment is not working properly. Sources include unvented fossil-fuel space heaters, unvented gas stoves and ovens, blocked chimneys or flues, gas dryer vented into the room, cars or other engines run in garages, and cracked combustion chamber in the furnace, and "backdrafting" from furnaces and water heaters.

Health Concern

It's sometimes difficult to determine if a person is experiencing carbon monoxide symptoms or if they are experiencing symptoms of the flu, food poisoning, or allergies. Low levels of carbon monoxide can cause nausea, dizziness, weakness and muscle aches. Higher doses can impair judgment, cause paralysis or coma, and death.

Reduce the Risk

Carbon monoxide alarms alert you to dangerous levels of carbon monoxide. It is important to choose and place an alarm wisely and maintain it to assure accurate sensing of carbon monoxide. 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 combustion chamber, or disconnected flue pipe; signs of soot around openings in your furnace or boiler; rust or cracks in the heat exchanger; soot or creosote build-up; and exhaust or gas odors.

Household Products

Volatile Organic Compounds (VOCs) are found in many household products. They are chemicals that easily evaporate to vapor or gas at room temperature. They are found in paints, solvents, air fresheners, hobby supplies, automotive products, dry-cleaned clothing, moth repellents, pesticides and some cleaners and disinfectants aerosol sprays, adhesives, manufactured wood products (pressed board), and fabric additives used in carpeting and furniture. Some common volatile organic compounds (VOCs) listed on product labels are: 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.

Health Concern

The unsafe use of many common household products can cause many undesirable health effects. Short-term effects include eye, nose and throat irritation, and headaches. Long-term exposure can cause loss of coordination; nausea; and damage to liver, kidneys and the central nervous system. Some organics can cause cancer in animals and are suspected of causing cancer in humans.

Reduce the Risk

First, read the labels of products you are considering buying. Note the product's ingredients and beware of all warnings of its use.

Always use household products only for their intended purpose and according to the manufacturer's instructions. And use them sparingly.

When possible use the product outdoors, in a separate building, or in a well-ventilated area.

Choose products that are packaged to reduce the chance of spills, leaks and child tampering.

Keep household products in their original containers so that safety information and directions for use are always with the product.

Lead Dust

Lead dust is a metallic element that is widely dispersed in the environment. It was used in oil-based paint until 1978, when it was banned. 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. Lead can be found near major traffic corridors in soils that have been contaminated from the long-term use of leaded gas.

Paint in good condition poses little risk. Paint that is peeling, chalking, or on deteriorating surfaces is especially risky. Sanding, scraping, and burning paint during remodeling can expose family members to high levels of lead. Lead has been used in many products, including automotive batteries, brass, solder, some plumbing pipe, and weights. Some imported products such as toys, candy, jewelry and pottery can also be exposure risks.

Health Concern

Young children (up to about six 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 in both children and adults. Lead accumulates in the body and its effects are irreversible. If you live in an older home, your children may be at high risk.

Reduce the Risk

Testing:

All children up to age six should be tested for lead in their blood. Ask your public health department about lead testing programs for children.

Do-it-yourself test kits are available at home centers, paint stores and ceramic supply stores. Their sensitivity is limited, though. 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.

Paint over surfaces before they peel, flake, or chalk.

Pick up loose paint chips with masking tape or duct tape.

Frequently damp mop to control dust if you live in an older home that likely or possibly has lead paint. (Vacuuming can disperse dust particles back into the room.)

Frequent washing of your child's hands and toys will also reduce exposure.

It's important not to sand or scrape leaded paint, or do any other activities that generate dust.

Eliminating lead dust hazards is complex and should only be done by professionals. Remediation measures include replacing windows and moldings, removing paint and covering surfaces with materials such as wallboard. Children should be removed until the site "clears" inspection.

Radon

Radon is an odorless radioactive gas that results from the breakdown of uranium from soil and rock beneath and around the foundation, ground water wells, and some building materials.

Radon 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 emit radon.

Health Concern

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. Radon is the second leading cause of lung cancer in the United States. Radon causes 15,000-22,000 lung cancer deaths each year. Smoking combined with radon exposure is an especially dangerous health risk.

Reduce the Risk

You can monitor radon levels yourself by following instructions and using either

short- or long-term test kits. Short-term kits are deployed for two to seven days and long-term kits are deployed for three months to one year. Such detectors cost about $5-$25 per kit, which usually includes analysis, postage and reporting on test results. Contact your local K-State Research and Extension office for test kit availability and testing guidance.

Radon levels can be reduced, most often by the installation of a soil ventilation system that draws the radon from beneath the house exhausts into the air above the house. Average national cost for these radon contractor installed systems is $1,200.

Secondhand smoke

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. This mixture contains more than 4,000 substances, more than 40 of which are known to cause cancer in humans or animals and many of which are strong irritants. Exposure to secondhand smoke is also called involuntary smoking, or passive smoking.

Health Concern

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). EPA estimates that environmental tobacco smoke, or ETS, causes approximately 3,000 lung cancer deaths in nonsmokers each year.

Secondhand smoke is a serious health risk to children. EPA estimates that passive smoking 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 between 7,500 and 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. Asthmatic children are especially at risk.

EPA estimates that exposure to secondhand smoke increases the number of episodes and severity of symptoms in hundreds of thousands of asthmatic children.

Passive smoking may also cause thousands of non-asthmatic children to develop the condition each year.

Passive smoking can lead to buildup of fluid in the middle ear, the most common cause of hospitalization of children for an operation.

Reduce the Risk

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

Reference

EPA Indoor Air – *http://www.epa.gov/iaq/*

Adapted from: *Indoor Air Hazards Every Homeowner Should Know About*, EPA 402-K-98-002.

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