Indoor Air Quality

Craven County Health Department

WORKING TOGETHER FOR YOUR HEALTH

Indoor Air Quality in Home Environments

We are providing you this information to help you address the indoor air quality in your home. It has been compiled from many sources, including the EPA and the NC Division of Public Health. Not all of the information in this packet is applicable to your situation, but we hope you can find what is helpful for you to solve your indoor air quality problems. We are available for telephone consultations with you, but cannot make all the home assessments that are requested of us.

Indoor air pollution, building-related illness, and "sick building syndrome" have received increased attention over the last several years. Research, conducted by various agencies such as the Environmental Protection Agency (EPA), has shown that the quality of indoor air can be many times worse than that of the outdoor air. Given the fact that many people spend as much as 90 percent of their time indoors, the health risk due to indoor air pollutants is a significant public health concern. Indoor air quality can affect people's health and can have economic and legal implications. For example:

- Pollutants can cause or contribute to short- and long-term health problems, including asthma, respiratory tract infections, allergic reactions, headaches, congestion, eye and skin irritations, coughing, sneezing, fatigue, dizziness and nausea.
- Indoor air pollutants can cause discomfort, and reduce attendance and productivity. Recent data suggest that poor IAQ can reduce a person's ability to perform specific mental tasks requiring concentration, calculation, or memory.
- Indoor air pollutants hasten building deterioration. For example, uncontolled moisture can result in mold growth that leads to the structural decay of building components.
- Poor indoor air quality strains relationships among employees, family members, parents, teachers, students and school administrations.
- Indoor air quality problems can result in liability issues or lawsuits.

Sources of Indoor Air Pollutants

Indoor air pollutants have increased over the part few decades for variety of reasons. Contributing to indoor air quality issues in homes are construction of more tightly sealed buildings, reduced ventilation rates to save energy, the use of synthetic building materials and furnishings, and increased use of chemical products such as pesticides, housekeeping supplies, and personal care products. The four basic factors affecting indoor air quality (IAQ) are indoor air pollutant sources; the heating, ventilation, and air-conditioning (HVAC) system; pollutant pathways; and occupants.

Moisture and Biologicals: Moisture problems in homes can result in the growth or amplification of biological and microbial organisms like mold, mildew, dust mites and pet dander. Exposure to these organisms can increase the risk of allergic illness, trigger asthma, cause respiratory infections, or have other health effects. Common sources of moisture include high indoor humidity, plumbing leaks, and water leaks. Poorly maintained heating, ventilation and air-conditioning systems can also contribute to moisture problems. To remedy the problem, the source of excess moisture must be found and fixed, and contaminated materials must be removed and discarded if they can not be thoroughly cleaned.

Combustion Products, including Carbon Monoxide: Adverse health effects from combustion products range from mild effects to death. Carbon monoxide, a deadly gas, kills over 200 people year in the United States. Other pollutants, such as nitrogen oxides, can cause breathing problems, particularly in sensitive individuals, and can trigger asthma attacks. Sources of combustion products include unvented fossil-fuel (oil, kerosene) heaters, unvented gas stoves and ovens, and back-drafting and malfunctioning furnaces and water heaters. During power outages, the indoor use of charcoal or gas grills or of gas-powered generators can cause serious carbon monoxide poisoning and possible death to people in the home. To ensure that combustion pollutants do not create IAQ problems, take the following steps:

1. All potential sources should be vented to the outside of the building.
2. Make sure all systems are regularly maintained and inspected.
3. Install carbon monoxide monitors in homes where there are fossil-fuel burning appliances.
4. NEVER USE a charcoal or gas grill indoors for cooking or heating.
5. NEVER USE a gasoline-powered generator indoors. Gas-powered generators MUST be used outdoors, in a well-ventilated area away from windows, doors and home air-intakes.

Environmental Tobacco Smoke: Secondhand smoke, or environmental tobacco smoke (ETS), can cause significant IAQ problems in homes and other buildings. ETS is a mixture of the smoke given off by the burning end of a cigarette, pipe or cigar, and the smoke that is exhaled from the lungs of the smoker. ETS contains more than 4,000 chemical compounds, approximately 40 of which are carcinogens or suspected carcinogens. 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). Children who breathe ETS are more likely to suffer from ear infections, pneumonia, bronchitis, and other lung diseases. ETS can increase the risk of asthma attacks in persons with asthma. For all these reasons, smoking should not be allowed in homes where there are children.

Formaldehyde: Sources of formaldehyde include durable-press drapes and other textiles, particleboard products such as cabinets and furniture, tobacco smoke and adhesives. Formaldehyde is an irritant to the eyes, nose and throat, and can cause tearing of the eyes, coughing and bronchial spasms. Formaldehyde is also a suspected human carcinogen. Careful selection of products and increased ventilation can help reduce health effects.

Household Products and Furnishings: Volatile organic compounds (VOCs) come from paints, solvents, pesticides, air fresheners, hobby supplies, dry-cleaned clothing, aerosol sprays, adhesives and fabric additives and wood treated with arsenic (CCA). Some of these VOCs can cause eye, nose and throat irritation; headaches; loss of coordination; nausea; or damage to the liver, kidneys, and central nervous system.

Particulates: Fireplaces, wood stoves kerosene heaters and unvented gas space heaters can produce air-borne particles (particulates). Dust and pollen are also considered particulates. Health effects from exposure to tiny particles that can be breathed into the lungs depend on the types and concentrations of the particles, the frequency and duration of exposure, and individual sensitivity. Health effects can range from irritation of the eyes and/or respiratory tissues to more serious effects, such as cancer and decreased lung function. Biological particles, such as animal and insect allergens, viruses, bacteria, and molds, can cause allergic reactions or infectious diseases.