



Air Quality Issues in the Home

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Understanding Indoor Air Quality Concerns

Studies show most of us spend an average of 16 hours per day at home. During most of the year in Wisconsin, the air is either too cool, too hot or too humid to allow a free exchange of inside air with outside air. In fact, as energy prices have soared, we have worked to reduce heating costs by decreasing the infiltration of outside air.

Over the last 10 years, the number of air changes per hour in the average home has been dropping. A typical older home might have as many as three or more air changes per hour. This means that all the air in the house was exhausted and replaced three times within an hour. Homes built under current building codes would have an air change every two hours, while a super-insulated home might have an air change every four to 20 hours.

Air change occurs naturally because of the action of wind and the "stack effect." Wind pressing against the side of a home creates a pressure difference with the inside air. Air penetrates the home to equalize the pressure. The pressure in the house is then greater than the pressure on the side of the house away from the wind, so air escapes. Exterior paint on this side of older homes may deteriorate more quickly because of moisture in the escaping air.

During the winter, the "stack effect" is an important source of air exchange. Heated air rises in the home just as it does in a chimney. It finds cracks and holes in the ceiling or other upper surfaces of the home and escapes. This reduces air pressure in the home. Air then infiltrates through the lower surfaces of the house to replace the lost air and equalize the pressure. Because these processes don't necessarily affect all the spaces in the home equally, air exchange rates may be higher in some rooms than in others.

Careful weatherization reduces both sources of air exchange. As a consequence, pollutants generated within the home are not exhausted or diluted and may in fact become concentrated. This has led to concern about indoor air contamination.

Potential problems have been made worse by other life-style changes. For example, many households are switching fuels. In 1972, fewer than 200,000 wood-burning stoves were sold. By 1981, sales increased to 1.5 million. An estimated 3 million kerosene heaters were in use in 1981. Emission from these heat sources contains a variety of potentially toxic substances. Households also are using more aerosols and wood-composition products, adding potential toxins to indoor air.

Causes of concern already mentioned — weatherization, wood burning, aerosols — represent changes in the household environment that actually increase health risks. Coupled with these new risks is new information. While the actual risks may not have changed, our understanding and awareness of the risks has grown. Sometimes this new information is overwhelming, leaving people so confused they take no action at all.

Recognizing Acute Versus Chronic Symptoms

Indoor air contamination can produce long-term or short-term health symptoms. Acute symptoms are immediate reactions such as breathing difficulties, smarting eyes, drowsiness and nausea. In many cases, acute symptoms warn us something is wrong and action should be taken.

The second type of symptoms are known as chronic effects. They are problems that develop over extended periods of exposure to toxic substances. People exposed to pollutants that have only chronic effects are usually unaware that the exposure is occurring.

For many substances, you can examine your home and life-style to determine whether a potential problem exists. *The Indoor Air Quality Assessment Checklist* (B3439) can help you make this examination. If a problem appears likely, a test for a particular substance can be arranged. The checklist refers to University of Wisconsin-Extension publications covering several common types of indoor air pollutants. Each publication provides information about specific testing procedures.

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