Awareness on the Silent Killer Radon Gas

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What is Radon?

Radon is a silent killer. An odorless, colorless, radioactive gas, it causes nearly 15,000 lung cancer deaths a year – more than any other health hazard except smoking. It is produced by the breakdown of uranium in soil, rock, and water. All rocks contain some uranium, although most contain just a small amount. Indoor radon is the second leading cause of lung cancer after smoking. The public and especially those with disabilities need to be educated about the dangers of radon.

What health effects are associated with radon exposure?

The Surgeon General has warned that radon is the second leading cause of lung cancer in the United States. There are currently no conclusive data on whether children are at greater risk than adults from radon. No specific subtype of lung cancer is associated with radon exposure.

Only smoking causes more cases of lung cancer. If you smoke and you are exposed to elevated radon levels, your risk of lung cancer is especially high. The U.S. Environmental Protection Agency (EPA) provides radon risk comparison charts for people who smoke and those who have never smoked. Stop smoking and lower your radon level to reduce your lung cancer risk.

Radon gas decays into radioactive particles that can get trapped in your lungs when you breathe. As they break down further, these particles release small bursts of energy. This can damage lung tissue and lead to lung cancer over the course of your lifetime. Not everyone exposed to elevated levels of radon will develop lung cancer, and the amount of time between exposure and the onset of the disease may be many years.

Breathing radon does not cause any short-term health effects such as shortness of breath, coughing, headaches, or fever.

In 1998, the National Academy of Sciences (NAS) released the Biological Effects of Ionizing Radiation (BEIR VI) Report, "The Health Effects of Exposure to Indoor Radon." The study reviewed and evaluated data from many prior studies and drew

conclusions, that fully support estimates by EPA that radon causes about 15,000 lung cancer deaths per year. Though some people debate the number of deaths, it is widely agreed that radon exposure is the second leading cause of lung cancer.

Research suggests that swallowing water with high radon levels may also pose risks. However, the risks from radon-contaminated drinking water are much lower than the risks from breathing air containing radon. A NAS report on radon in drinking water, "Risk Assessment of Radon in Drinking Water," was released in 1999. It concluded drinking radon in water causes about 19 stomach cancer deaths per year.

EPA provides more information about health effects from radon in their publication, Radon - A Physician's Guide.

What is the "acceptable" level of radon in air?

EPA states that any radon exposure carries some risk; no level of radon exposure is always safe. However, EPA recommends homes be fixed if an occupant's long-term exposure will average 4 picocuries per liter (pCi/L) or higher.

How does radon get into a building?

Most indoor radon comes into the building from the soil or rock beneath it. Radon and other gases rise through the soil and get trapped under the building. The trapped gases build up pressure. Air pressure inside homes is usually lower than the pressure in the soil. Therefore, the higher pressure under the building forces gases though floors and walls and into the building. Most of the gas moves through cracks and other openings. Once inside, the radon can become trapped and concentrated.

Openings which commonly allow easy flow of the gases include the following:

- Cracks in floors and walls
- Gaps in suspended floors
- Openings around sump pumps and drains
- Cavities in walls
- Joints in construction materials
- Gaps around utility penetrations (pipes and wires)
- Crawl spaces that open directly into the building

Radon may also be dissolved in water, particularly well water. After coming from a faucet, about one ten thousandth of the radon in water is typically released into the air. The more radon there is in the water, the more it can contribute to the indoor radon level.

Trace amounts of uranium are sometimes incorporated into materials used in construction. These include, but are not limited to concrete, brick, granite, and drywall. Though these

materials have the potential to produce radon, they are rarely the main cause of an elevated radon level in a building.

Outdoor air that is drawn into a building can also contribute to the indoor radon level. The average outdoor air level is about 0.4 pCi/L, but it can be higher in some areas.

While radon problems may be more common in some geographic areas, any home may have an elevated radon level. New and old homes, well-sealed and drafty homes, and homes with or without basements can have a problem. Homes below the third floor of a multi-family building are particularly at risk.

Can the radon level in a building's air be predicted?

No, it is not possible to make a reliable prediction.

The only way to determine the level is to test. EPA and the Surgeon General recommend testing all homes below the third floor for radon.

To date, millions of Americans have tested their homes, offices, and schools for radon. Although progress has been made, continued public awareness is needed to remind all persons about the importance of testing for radon. The test is easy, inexpensive, and most important, effective. By taking this simple preventive step, you can reduce radon levels significantly and ensure a healthier future. There are many do-it-yourself kits you can buy at retail stores or through the mail. However, you should only purchase kits from providers if they have met EPA's qualifications for radon measurements.

The National Safety Council offers low-cost short and long-term radon kits to people who want to test their homes. The test kits meet all EPA requirements. The price includes lab analysis and return postage. You can order your radon test kit from the web **http://www.nsc.org/ehc/radon/coupon.htm** or a faster processing kit can be ordered directly from the radon Helpline, (800) 557-2366.

There are several different methods used to reduce radon levels in homes. The most common are sealing cracks and opening, which prevents the radon from getting into the home, and using natural air ventilation in the basement.

A map of radon zones has been created to help national, state, and local organizations target their resources and implement radon-resistant building codes. However, the map is not intended to be used to determine if a home is in a given zone or if it should be tested for radon. Homes with elevated levels of radon have been found in all three zones.

In addition, indoor radon levels vary from building to building. Do not rely

on radon test results taken in other buildings in the neighborhood - even ones next door - to estimate the radon level in your building.

Contact your state radon office for information about radon in your local area. The Internet is also a source of information about radon levels in some states.

Where can I get more information about radon issues?

If you would like additional information call the Missouri state radon contact at (573) 751-6160. The National Safety Council's Radon Hotline provides a toll-free number, (800) 767-7236. Through this automated number, callers can order a brochure on radon. It contains information on ordering a low-cost short-term test kit. In addition, users can call (800) 557-2366, if they wish to speak with an information specialist. Specialists are available assist callers between 9:00 AM to 5:00 PM (Eastern) on business days. They can answer specific questions and mail free, single copies of many radon documents, including the EPA booklet, *Home Buyer's and Seller's Guide to Radon*.

Multiple copies of many EPA documents can be ordered through EPA's National Service Center for Environmental Publications, (800) 490-9198, fax (513) 489-8695. Publication requests can also be mailed, called, or faxed directly to:

U.S. Environmental Protection Agency
National Center for Environmental Publications (NSCEP)
P.O. Box 42419
Cincinnati, OH 42419

For additional information, see MU Guide Sheet G1968. Contact your local Outreach and Extension Center or the MU Extension Rural Safety and Health Program at 1.800.995.8503.

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