

Anne Johnson: Welcome to Environmental Health Chat, a podcast about how the environment affects our health, from the National Institute of Environmental Health Sciences. I'm your Host, Anne Johnson.

I'm going to start by playing a short clip of what will be our topic for the day. Listen to this. No need to adjust your headphones. The sound you just heard was silence. That's because today we're talking about a silent odorless, colorless gas. It's also radioactive. It's called radon. Radon induced lung cancer kills more than 20,000 people in the United States each year. Radon can be found in homes, schools, and in every state in the country. The good news is there's a lot you can do to protect yourself and your family from radon.

Our expert today is Dr. Bill Field. He's a Professor in the Department of Occupational and Environmental Health and in the Department of Epidemiology at the University of Iowa. I asked him to start by telling us what radon is and where it comes from?

Bill Field: Radon is an invisible – it's a radioactive gas that tends to build-up in homes and other enclosed structures. It's formed from the breakdown of uranium, which is found in the soil and rocks around the home. Since radon gas is fairly mobile it can enter the home through cracks in the foundation, around pipes, even if you don't have a basement, if you just have a home built on a pad, if you have cracks or penetrations around pipes that are coming in, radon can get into the home that way.

Anne Johnson: Even though radon occurs naturally, when it builds up in our homes it can lead to major health problems.

Bill Field: The problem arises when radon breaks down to little solid particles that can be inhaled. As they're inhaled and deposit in the lung, it makes changes within the lung that can initiate lung cancer.

In the United States we have about 160,000 lung cancer deaths each year, and about 21,000 of these are related to radon induced lung cancer, which makes radon the second leading cause of lung cancer, but radon is really the leading environmental cause of cancer death or cancer mortality in the United States.

Anne Johnson: Bill and his colleagues have studied the relationship between radon and lung cancer in Iowa. Iowa has one of the highest average concentrations of radon in the country.

Bill Field: We were very fortunate in getting funding from the NIEHS to perform a large-scale case control study here in Iowa. We had over 1,000 participants, and we had cases, these were people with lung cancer, and then we had controls, people without lung cancer, and we performed very extensive radon testing in the homes of the cases and the controls. We compared the radon exposure of the cases versus the radon exposure to the controls to get an idea of what the risk was that was posed by the protracted radon exposure. What we found was that for 15-year exposure at the EPA's action level we found about a 50% increase in lung cancer risk.

Anne Johnson: The results of that study and other similar studies have confirmed that radon represents a major threat to public health across the nation. Fortunately, there are things you can do to find out if radon is a problem in your home and to reduce your risk.

Bill Field: The only way to know if you have a problem with radon is to perform a radon test. Generally, what's usually done is a charcoal canister type test. Now these are placed in the lowest livable area of the home for about two to five days, and you want a second detector placed, as well, just to verify that there's good agreement between the two detectors. These cost between \$10, \$15, to \$20 and are available at local hardware stores or discount stores.

Anne Johnson: If a test shows you have radon above the EPA's recommended action level of four picocuries per liter you don't have to move to a new house. There are ways to channel radon around your house to get your indoor concentrations to a safe level.

Bill Field: You can retrofit a home with a radon mitigation system, and what that involves is finding a location, either in the basement or if you don't have a basement on the pad, on the first floor, that you can run a PVC tube through and then find a place to run it up through the eaves of the home. And then you would install a fan to this system and 99.5% of the time it can reduce the concentrations to well below two picocuries per liter.

Anne Johnson: But Bill said the more long-term solution is to incorporate radon resistant features into new homes while they're being built. For example, builders can place liners under the house and install vent pipes to allow radon to escape, but in most places such measures aren't required by law and the radon exposure threat is growing as more houses are built without radon resistant features.

Bill Field: We're still losing the battle, there's more homes that need radon mitigation now than existed 20 years ago because we keep building houses at a faster rate than we're installing systems when they're built to take care of the radon problems.

Anne Johnson: Bill and his colleagues are working hard to spread the word about radon and encourage radon testing and radon resistant construction for homes and schools.

Bill Field: There's a good number of states that require testing for daycare centers now and for some schools. There's even some cities and counties that require installation of a [passive] radon system during the construction of the home. So a lot of the progress has been made, but there's a lot of work to do.

Anne Johnson: Visit our website for links where you can find more information about radon and radon testing. You can also learn about radon issues in your state by calling 1-SOS-RADON.

Thanks to Bill Field of the University of Iowa for telling us about radon research. You've been listening to Environmental Health Chat. I'm your Host, Anne Johnson, and our podcast is brought to you by the Partnerships for Environmental Public Health, a program of the National Institute of Environmental Health Sciences. Find us online at [niehs.nih.gov/podcasts](http://niehs.nih.gov/podcasts).