

Fixing radon problems reduces lung cancer risk

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"If my home has a radon problem, what can I do next?"

This question often arises every radon-testing season. Fortunately, any home with a radon problem is fixable, and a radon mitigation system will reduce radon concentrations.

Radon is a colorless, odorless and tasteless radioactive gas that emanates from decaying uranium found naturally in the soil and rocks. This gas can accumulate in a building and can cause lung cancer. If a home has a level of 4 picocuries per liter of air (pCi/l) or higher, there is potential for a radon problem. To put this into perspective, a home with an annual average of 4 pCi/l presents the same risk of developing lung cancer as someone who smokes about half a pack of cigarettes a day. However, fixing a home with a radon problem reduces the risk of radon-caused lung cancer.

Following a short-term test, different radon test results dictate different actions. If an individual tests and receives a level below 4 pCi/l, no mitigation is

needed. The recommendation is to test every two years, before and after home improvement projects, after any significant seismic activity and during the colder season if the initial test was in warmer months.

If radon concentrations are between 4 pCi/l and 8 pCi/l, individuals should obtain a long-term, yearlong test kit. This test provides an annual average of fluctuating radon concentrations during the test period. If the annual result is 4 pCi/l or higher, fix the home.

On the other hand, after an initial short-term test with a level above 8 pCi/l, use another short-term kit to verify the accuracy of the first test, then consider mitigation.

Several mitigation techniques exist, but the two most common are crawl space mitigation, also known as a sub-membrane depressurization, and concrete slab mitigation, known as subslab depressurization.

Since every home is different, the following descriptions are general radon mitigation methods. For a submembrane depressurization system, the crawl



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A mitigator caulks the crawl space sheeting.

space is cleared of obstructions and old Visqueen that might prevent a new system from properly functioning. Next, a perforated pipe is installed over the dirt. This piping later connects to a pipe system with a fan located either outside of the home or in the attic. If the piping system is routed up the side of the home, the pipe must terminate at least 6 inches above the roof eave and no closer than 10

feet from any window or chimney opening.

If the system is routed through the attic, the pipe must terminate at least 12 inches above the roof surface. A minimum of 3-millimeter cross-laminated polyethylene sheeting is placed over the dirt in the crawl space and is sealed to the floor joists, stem walls and sheeting seams with polyurethane caulking. The sheeting acts as a membrane and traps the radon and soil gas. To power the exhaust fan, a junction box is installed near the fan. The fan runs constantly to remove all trapped radon and soil gases below the membrane. The gases expel above the roof surface, reducing the radon concentration within the house. A manometer is installed on the piping system to measure the air pressure to ensure it's properly working.

Conversely, with a subslab depressurization system, foundation cracks and floor joints are sealed with a polyurethane caulking. Strategically placed 3- to 4-inch diameter holes are drilled in the

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concrete foundation, preferably in an unobtrusive place, such as a closet or utility room. Gravel and dirt are removed beneath the hole, and similar to a sub-membrane depressurization system, a piping system is connect-

ed to the drilled hole with an exhaust fan at the other end. The radon and soil gases are pulled from below the home and exhausted above the roof surface.

Mitigation prices vary depending upon square footage and foundation type. Similar to the cost of a home improvement project, slab mitigations average about \$2,500 and crawl space mitigations average \$3,800.

A do-it-yourself manual is available for purchase or to check out at local libraries. For those unable to mitigate themselves, a certified radon mitigator with a state contractor's license should be hired. The two certified radon mitigators within the state of Nevada can be found at www.radonnv.com or by calling the Radon hotline, 1-888-723-6610, for more information. Free radon test kits are available at University of Nevada Cooperative Extension and partner offices until Feb. 29.

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