



Radon

Updated

June 2009

IT'S YOUR HEALTH



Radon

The Issue

Exposure to high levels of radon increases the risk of developing lung cancer. This relationship has prompted concern that radon levels in some Canadian homes may pose a health risk.

Background

Radon is a colourless, odorless, radioactive gas that occurs naturally in the environment. It comes from the natural breakdown of uranium in soils and rocks.

The Health Effects of Radon

In the open air, the amount of radon gas is very small and does not pose a health risk. However, in some confined spaces like basements and underground mines, radon can accumulate to relatively high levels and become a health hazard. Exposure to high levels of radon has been associated with an increased risk of lung cancer, depending on the time length of exposure.

Because it is radioactive, radon decays. As it decays, it produces decay products, sometimes called “radon daughters” or “radon progeny”. Two of these progeny, polonium-218 and polonium-214 decay rapidly themselves, and emit alpha particles. When alpha particles hit an object, the energy in them is absorbed by the surface of the object. Human skin is thick enough to not be affected, but if you breathe in alpha particles, they can

damage bronchial and lung tissue, and can lead to lung cancer.

Studies of the incidence of lung cancer among uranium miners showed a correlation between radon exposure and deaths from lung cancer. Until recently, there had been no evidence of a direct link between radon levels in the home and lung cancer. However, two recent independent scientific studies in Europe and North America show that lung cancer risks extend to levels of radon found in some homes.

Radon in the Home

Radon gas can move through small spaces in the soil and rock upon which a house is built. It can seep into a home through dirt floors, cracks in concrete, sumps, joints, basement drains, under the furnace base and jack posts if the base is buried in the floor. Concrete-block walls are particularly porous to radon and radon trapped in water from wells can be released into the air when the water is used.

A survey conducted by Health Canada in the 1970s showed that radon levels in certain Canadian cities were higher than in others. However, these same studies showed that it is impossible to predict whether any one house will have a high level of radon. Factors such as the location of the house and its relation to the prevailing wind may be just as important as the source of the radon.

Measuring Radon Levels in the Home

Commercial services are available to homeowners who wish to measure radon levels in their homes. Radon is measured in units called “becquerels per cubic meter”. The most popular radon detectors are the charcoal canister, the electrets and the alpha track detector. These devices are exposed to the air in a home for a specified period of time, and then sent to a laboratory for analysis. There are other techniques for testing radon levels, but they require a trained operator and are more expensive.

Minimizing Your Risk

Health Canada’s studies show that high radon levels are not widespread in Canadian homes. However, it is difficult to predict the level in any one home. If you are concerned about exposure to radon gas in your home, you might consider testing the level to see if it exceeds Canada’s guideline for exposure to radon in indoor air. The guideline, which was updated in 2007, recommends that:

- Remedial measures be taken in a dwelling whenever the average annual radon concentration in the normal occupancy area exceeds 200 becquerels per cubic meter.
- The higher the radon concentration, the sooner remedial measures should be taken.
- When remedial action is taken, the radon level should be reduced to a value as low as practicable (i.e., reduced as much as possible using methods that are cost-effective).
- The construction of new dwellings should employ techniques that will minimize radon entry and will facilitate post-construction radon removal, should this subsequently prove necessary.

Because there is some risk at any level, homeowners may want to reduce their exposure to radon, regardless of levels tested. Some of the steps you can take to reduce radon levels in your home include:

- Renovating existing basement floors, particularly earth floors.
- Sealing cracks and openings in walls and floors, and around pipes and drains.
- Ventilating the sub-floor of basement floors.

See the Need More Info? section below for links to helpful information, including details about the new guideline and how to obtain a booklet called Radon - A Guide for Canadian Homeowners.

Health Canada's Role

Health Canada has taken a number of steps to protect Canadians from the potential dangers of radon gas. These include evaluating measurement techniques, conducting research into effects of radon exposure and developing guidelines.

Health Canada’s guideline for exposure to radon has always been based on the best available scientific evidence of health risk. In 1988, a guideline of 800 becquerels per cubic metre was established in Canada. After considering new evidence about radon and the risk of lung cancer, Health Canada worked in partnership with the provinces and territories to develop a proposed new guideline of 200 becquerels per cubic metre, which is four times more stringent than the previous one. Following a series of consultations with interested stakeholders and the general public, the new guideline was finalized in June 2007.

Health Canada continues to work with the provinces and territories to help raise awareness among homeowners and assist them in finding solutions to lower the levels of radon in their homes.

Need More Info?

Radon
Radiation Protection Bureau,
Health Canada
2nd Floor,
Radiation Protection Building
775 Brookfield Road
Ottawa, ON K1A 1C1
[www.hc-sc.gc.ca/ahc-asc/
branch-dirgen/hecs-dgsesc/
sep-psm/rpb-br-eng.php](http://www.hc-sc.gc.ca/ahc-asc/branch-dirgen/hecs-dgsesc/sep-psm/rpb-br-eng.php)

For more information, visit
www.healthcanada.gc.ca/radon

For additional articles on health and safety issues go to the It’s Your Health Web section at :
www.healthcanada.gc.ca/iyh
You can also call toll free at 1-866-225-0709
or TTY at 1-800-267-1245*