



RADON

The Issue

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

Background

Radon is a colourless, odourless, radioactive gas that occurs naturally in the environment. It comes from the natural breakdown of uranium, and can be found in high concentrations where soils and rocks contain uranium, granite, shale, or phosphate. Radon can also be found in soils contaminated with certain types of industrial wastes, such as the by-products of uranium or phosphate mining.

The Health Effects of Radon

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

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 not to be affected, but if you breathe in alpha particles, they can damage bronchial and lung tissue, and can lead to lung cancer.

In the 1970s, studies of the incidence of lung cancer in Canada among uranium miners showed a correlation between radon exposure and deaths from lung cancer. Until recently, there was no evidence of a direct link between radon levels in the home and lung cancer. However, in 2005, two independent scientific studies in Europe and North America showed that radon levels in some homes may pose an increased risk of lung cancer.

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 walls and floors, 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 metre." The most popular radon detectors are the charcoal canister 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 radon pollution is 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 levels, and/or taking the following steps to reduce radon levels

- Renovate existing basement floors, particularly earth floors.
- Seal cracks and openings in walls and floors, and around pipes and drains.
- Ventilate the sub-floor of basement floors.

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 all aspects of radon gas, and developing guidelines.

Although provincial and territorial governments have jurisdiction over the health effects of background radiation, Health Canada has recommended that the guideline for exposure to radon gas should be 800 becquerels per cubic metre as the annual average concentration in a normal living area. The guideline is an upper limit, and Health Canada recommends taking action to reduce radon levels in your home if they exceed the limit. Because there is some risk at any level of radon exposure, homeowners may want to reduce their exposure to radon, regardless of levels.

Recent scientific evidence and advances is bringing about a review of the current radon guideline in a normal living area. A federal-provincial working group and Health Canada are currently assessing a lower radon guideline level. Provincial and territorial partners are responsible for the implementation of the guideline.

Health Canada's guideline for exposure to radon has always been based on the best available scientific evidence about health effects. After considering new evidence about radon and the risk of lung cancer, Health Canada is proposing a revised guideline for radon gas levels in indoor air. The proposed new guideline, which was developed in partnership with the Provinces and Territories, is 200 becquerels per cubic metre. This is four times more stringent than the current guideline of 800 becquerels per cubic metre.

Health Canada is collecting feedback on the proposed new guideline from interested stakeholders and the general public. A final report on the consultations and recommended guideline will follow.

Health Canada also 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. Because there is some risk at any level of radon exposure, homeowners may want to reduce their exposure to radon, regardless of levels.

Need More Info?

Contact:
Radiation Protection Bureau,
Health Canada
2nd Floor,
Radiation Protection Building
775 Brookfield Road
Ottawa, ON K1A 1C1

Health Canada and the Canada Mortgage and Housing Corporation have produced a booklet called Radon - A Guide for Canadian Homeowners. For a copy, visit the Canada Mortgage and Housing Corporation Web site at: <http://www.cmhc-schl.gc.ca/> and search for Radon. or call 1-800-668-2642.

In some parts of the country, more information about charcoal canisters and the alpha track detectors to test for radon levels, can be found by checking your local Yellow Pages for "Home Inspectors" at: www.yellowpages.ca

For more information on occupational concerns, go to The Canadian Centre for Occupational Health and Safety - What is Radon at: http://www.ccohs.ca/oshanswers/phys_agents/radon.html

Also, see the following Web sites:

Natural Resources Canada,
Radiation Geophysics, Radon at:
http://gsc.nrcan.gc.ca/gamma/radon_e.php

US Environmental Protection Agency, Indoor Air, Radon at:
<http://www.epa.gov/radon/index.html>

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