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# RADON AND YOUR HEALTH

## What you need to know.

Contact us to find out more:

THE  LUNG ASSOCIATION™  
British Columbia

2675 Oak St., Vancouver, BC V6H 2K2  
604-731-5864 • Call toll free 1-800-665-5864  
Fax: 604-731-5810 • www.bc.lung.ca / info@bc.lung.ca



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### WHAT IS RADON?

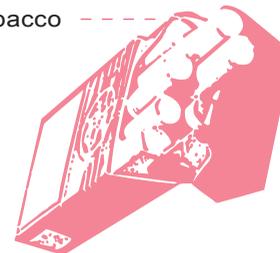
Radon is a radioactive gas that occurs naturally when uranium in soil and rock breaks down. It is invisible, odourless and tasteless. When released from the ground into the outdoor air, radon is diluted and is not a concern. However, in enclosed spaces such as homes, it can sometimes accumulate to high levels, which can put people's health at risk.

### WHAT ARE RADON'S HEALTH EFFECTS?

Radon gas decays to form radioactive elements that can be inhaled into the lungs. In the lungs, the process of decay continues, creating more radioactive particles that release small bursts of energy. This energy is absorbed by nearby lung tissues, damaging lung cells. Damaged cells could potentially result in cancer when they reproduce.

The risk of developing cancer due to radon depends on both the level of radon and the length of exposure to that level. Exposure to high radon levels in indoor air increases a person's risk of developing lung cancer.

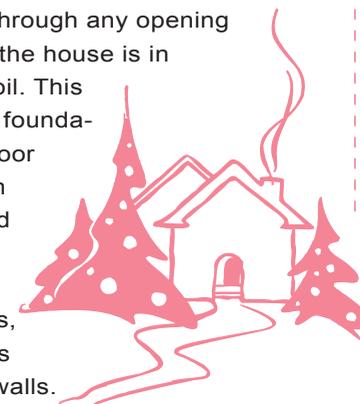
Radon exposure and tobacco use together can significantly increase lung cancer risks. For example, a lifelong smoker who is not exposed to radon has a one in eight risk of developing lung cancer. With exposure to high radon levels, that risk grows to one in three. On the other hand, a non-smoker exposed to the same high radon levels has a lower lifetime lung cancer risk of one in twenty.



### HOW CAN RADON GET INTO ONE'S HOME?

Air pressure inside the house is usually lower than in the soil surrounding its foundation. This difference in pressure draws air and other gases, including radon, from the soil into homes.

Radon can enter through any opening in the area where the house is in contact with the soil. This includes cracks in foundation walls and in floor slabs, construction joints, gaps around service pipes, support posts, window casements, floor drains, sumps or cavities inside walls.



### WHAT ARE THE RADON LEVELS IN CANADA?

Radon is found across Canada because it occurs naturally in soil. Concentrations differ greatly, but are usually higher in areas where there is a higher amount of uranium in underlying rock and soil. Some amount of radon is found in almost every home, but concentration levels will vary from one house to another, even if they are similarly constructed and stand next to each other. Only a small percentage of homes are expected to have radon levels above the guideline, but the only sure way of knowing a home's radon level is to have it tested.

### WHAT IS THE CURRENT CANADIAN GUIDELINE FOR RADON IN INDOOR AIR?

Based on new information about potential health risks, the current Canadian guideline for radon



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in indoor air is 200 Becquerels per cubic metre (200 Bq/m<sup>3</sup>) per dwelling. This guideline represents a reduction from the former 800 Bq/m<sup>3</sup> guideline. A Becquerel is equivalent to one radioactive disintegration per second. Individual dwelling owners should reduce radon levels as much as they reasonably can, using methods that are affordable and practical, and ensure that levels don't go above the new guideline.

At 800 Bq/m<sup>3</sup>, the risk for a non-smoker is higher than for all common accidental deaths (from motor vehicle accidents, drowning, falls, fire and more) combined. If we take precautions against accidental deaths by wearing seatbelts and lifejackets and by ensuring that our smoke detectors are working, we should also be testing our homes for radon.

## HOW ARE HOMES TESTED FOR RADON?

Testing for radon is easy and inexpensive. There are several types of devices that can be used to test a dwelling for radon. Short-term radon test devices are



typically used for a period of 2 to 7 days, while long-term radon test devices are used for 3 to 12 months. Since radon concentration inside a home may vary over time, measurements gathered over a longer period of time will give a more accurate picture of the annual average radon concentration. Health Canada recommends that homes be tested for a minimum of three months, ideally between October and April. For more information on how to test for radon, visit the Health Canada website at [www.healthcanada.gc.ca/radon](http://www.healthcanada.gc.ca/radon).

## WHERE CAN A RADON TEST DEVICE BE OBTAINED?

Currently, radon test devices can be ordered via telephone or on the Internet from Canadian companies and US-based service providers. The test device is mailed and complete instructions on how to set it up and send it back for lab analysis after the testing period is over are provided. Health Canada is also encouraging home improvement and hardware retailers to stock and sell some of these devices. The cost of testing typically ranges from \$50 to \$100.



## WHERE AT HOME SHOULD THE TEST BE PERFORMED?

To get a realistic estimate of radon exposure at home, all measurements should be made in the lowest lived-in level of the house, i.e., the lowest level that is used or occupied for more than four hours per day. For some, this may be a basement with a recreational room; for others, this will be the ground floor. If a basement is used only once a week to do laundry, there is no need to test on that level as exposure time will not be long enough to create health effects.

## WILL HIGH RADON LEVELS AFFECT A HOME'S VALUE?

When a high radon level is detected at home, the problem can often be successfully addressed at a cost lower than the value of the house. Because fixing the problem may in fact protect the value of one's home, it pays to attend to it just like any other items requiring regular home maintenance.

## HOW CAN RADON LEVELS AT HOME BE REDUCED?

For homes with radon levels above the guideline of 200 Bq/m<sup>3</sup>, the following measures are recommended:

- Increase mechanical ventilation via a heat recovery ventilator (HRV) to allow exchange of air.
- Seal all cracks and openings on foundation walls and floors and around pipes and drains.
- Paint basement floors and foundation walls with two coats of paint and sealant.
- Ventilate the basement sub-flooring by installing a small pump to draw radon from under the concrete slab to the outside before it can enter the house.
- Renovate existing basement floors, particularly earth floors.



Active Soil Depressurisation (ASD) is the most common and effective radon reduction method; it is typically performed by a contractor.

When hiring a contractor to do ASD, Health Canada recommends that the contractor be certified by an accredited organization. Health

Canada is working with stakeholders and partners to develop a set of certification requirements for radon mitigation companies.

Currently, Health Canada recognizes the certification programs offered by the National Environmental Health Association (NEHA) (visit [www.neha-nrpp.org](http://www.neha-nrpp.org) or call 1800 269-4174) and the National Radon Safety Board (NRSB) (visit [www.nrsb.org](http://www.nrsb.org) or call (914) 345-1168).

## HOW MUCH WILL IT COST TO LOWER RADON LEVELS AT HOME?

The cost of radon reduction will depend on the size and design of a house and the amount of work required. Typically, the cost will range from \$50 to \$3,000.

## WHERE CAN ONE LEARN MORE?

For more information on radon and testing one's home, visit the Health Canada website at [www.healthcanada.gc.ca/radon](http://www.healthcanada.gc.ca/radon) or call 1 800 O-Canada (1 800 622-6232).

Health Canada and the Canada Mortgage and Housing Corporation (CMHC) publish a booklet called "Radon – A Guide for Homeowners" that provides more information on radon, including testing for it and reducing high concentration levels. For a free copy, visit the CMHC website at [www.cmhc-schl.gc.ca](http://www.cmhc-schl.gc.ca) and search for "radon" or call 1 800 668-2642.

Source: "Radon: Is it in Your Home?", Health Canada (2008). Adapted and reproduced with the permission of the Minister of Public Works and Government Services Canada, 2009.

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