Radon in your house? Find out by measuring!

You don't let just anyone walk into your home, especially when no one's there. Yet radon, a possibly dangerous radioactive gas that seeps up from the ground, has no qualms about entering your home whenever it can. And without anyone being the wiser. Its presence cannot be detected by the senses. But before making a special effort to block its access, make sure the intruder is really a problem…

Radon and lung cancer
Radon is associated with approximately 10% of deaths from lung cancer in Quebec. It is the main cause of this cancer in non-smokers; the number two cause overall, after smoking. But it's the radon-tobacco cocktail that has proven to be the most lethal: a document from the Institut national de santé publique du Québec reveals that approximately 90% of deaths from lung cancer due to radon occurred in smokers.

Is radon entering through your basement?
Radon is produced naturally when uranium in the Earth's crust decays and it does not pose a problem when it diffuses into the atmosphere. Small traces that are little cause for concern are found in almost all dwellings. The threat of an increased risk of lung cancer, however, becomes all too real if a person is exposed to high **concentrations** of radon for **more than four hours daily**.

Because it is a little heavier than air, radon is more likely to settle and cause harm in a building's low, non-ventilated area, such as a **basement in winter**. It usually seeps in from the bare ground of a crawl space and through unsealed cracks and joints in foundation walls, floor slabs, septic tanks or plumbing. To a lesser degree, well water can incorporate radon that is released into the air in the house, when agitated (showers, laundry, kitchen, etc.).

The basics of reliable testing
Only a screening test using a recognized device with results analyzed by a **certified laboratory** will set your mind at ease and leave your lungs… breathing easy.

You can perform the **test to measure** your home's radon level yourself. The Quebec Lung Association[1] offers one of two types of alpha-particle trajectory detector (**dosimeter**) recommended by Health Canada for $60 (including analysis and taxes).

The test should be performed **over a period of at least 3 months**, but ideally over 12 months, for reliable readings. Radon levels can fluctuate considerably over the course of a day, even more so from one season to another. They are usually higher in winter. The dosimeter must be placed at the lowest spot in the house where there is a bedroom, living- or work space occupied more than four hours a day. An instruction booklet specifies how far from the wall, floor and ceiling the detector should be installed as well as which rooms and spaces to avoid so that the reading will be true. The **Guide for Radon Measurements in Residential Dwellings (Homes)** found on Health Canada's website[2] can also be of help.

Dangerous concentrations

Radon concentration is usually expressed in becquerels per cubic metre of air (Bq/m3). Health Canada has established that **corrective measures** should be implemented if the average annual radon concentration in the normal occupancy area is greater than **200 Bq/m3**.

The recommended remedial action time is less than 2 years for radon concentrations measuring from 200 Bq/m3 to 600 Bq/m3. For higher concentrations? Swift action — less than 12 months — is recommended. A Quebec study conducted 15 years ago estimated that approximately 23,000 homes displayed evidence of radon concentrations above 200 Bq/m3. Some of the highest concentrations in the country to date have been found in the Basses-Laurentides region (Oka, Saint-Joseph-du-Lac and Saint-André-d'Argenteuil). Disturbing levels have been reported even more recently in the Mont-Saint-Hilaire area and the Antoine-Labelle regional county municipality, around Mont-Laurier.

Ventilate, plug and seal…
Many measures to reduce radon levels in existing dwellings are described and illustrated in the **free booklet** from the Canada Mortgage and Housing Corporation (CMHC).[3]

Of course, radon can be prevented from entering a home by finding and plugging cracks in cement foundation walls and floor slabs, including openings around components that run through them. Radon build-up can also be prevented by making sure basements are properly ventilated at all times. In some cases, it may even be necessary to install a depressurization system to extract radon trapped in the floor slab.

Health Canada points out that, given the uniqueness of each building's architecture and mechanical equipment (ventilation, heating, etc.), the appropriate "medicine" can only be prescribed following a professional diagnosis.

There are presently some Quebec businesses certified by the National Environmental Health Association4, one of the two independent organizations recognized for radon remediation. This situation — which should soon be rectified — is attributed to the fact that requests for action were extremely rare in 2007, when the concentration limit was 800 Bq/m3. In the meantime, homeowners can call on experts in building mechanics, ventilation or other related areas for help. An entire section of the CMHC guide covers selection criteria for contractors, estimate basics and the follow-up process (evaluating the effectiveness of the measures employed).

[1.] Quebec Lung Association: www.pq.lung.ca/environment-environnement/radon/ Tel.: 514 287-7400 or 1 800 295-8111
[2.] Guide for Radon Measurements in Residential Dwellings (Homes), published by Health Canada (healthcanada.gc.ca/radon)
[3.] Radon: A Guide for Canadian Homeowners, published by the Canada Mortgage and Housing Corporation, is available from the CMHC Website or by calling 1 800 668-2642
[4.] National Environmental Health Association: www.neha-nrpp.org/Canada_Mitigation.html