

Radon: Informing your patients about home screening and exposure reduction as cancer prevention

Radon is a naturally occurring radioactive gas produced from the fission of uranium in bedrock. Radon decays to alpha-emitting metals that, once inhaled, can damage DNA in the lung's epithelial surfaces. Radon is the leading cause of lung cancer in nonsmokers and increases the risk of lung cancer in smokers. Exposure to radon accounts for more than 3000 lung cancer deaths annually across Canada, with more than 200 deaths in BC alone.¹

Although radon is present in outdoor air, typically at low concentrations, exposure becomes a concern when it accumulates in indoor spaces. Because radon is a gas, it can infiltrate indoors, moving from rock and soil through permeable building foundations. Indoor radon concentrations depend on sub-soil types, foundation treatments, housing characteristics, and ventilation/heating conditions; concentrations can vary dramatically between homes located in the same neighborhood. The highest radon concentrations tend to occur in the lowest level of a building, such as basements.

In 2007 Health Canada lowered the guideline for annual radon concentrations from 800 to 200 Bq/m³, bringing it closer to those of the US Environmental Protection Agency (150 Bq/m³) and the World Health Organization (100 Bq/m³).² Although many homes in BC may have radon concentrations below the Health Canada guideline, particularly those located in the Lower Mainland and on Vancouver Island, "hotspots" can be found throughout the interior and

northern parts of the province (Figure available online at bcmj.org). For example, Dana Schmidt, of the Donna Schmidt Memorial Lung Cancer Prevention Society, reports that over 44% of homes tested in Castlegar are above the 200 Bq/m³ guideline.³

Health Canada recommends that everyone test for radon, preferably over a minimum 3-month period during winter (when concentrations are highest) with the radon monitor placed at the lowest lived-in level of the home. Testing is easy and inexpensive: both the Northern Health Authority⁴ and BC Lung Association⁵ provide kits at reduced cost (\$30) while the Donna Schmidt Society offers kits for free.³ Although multiple organizations have spread the radon message, many British Columbians may remain unknowingly exposed to elevated radon concentrations in their homes. Physicians can champion this important public health issue by talking to their patients about the dangers of radon and by encouraging them to test their homes. Homes with children, because their lungs may be damaged earlier, and homes with smokers, because of the synergistic effects of cigarette smoke and radon, should especially be tested.

Home testing is only part of the solution. If high levels are found, homes must be mitigated. Mitigation involves either limiting entry of radon into the home or expelling radon to the outdoors before it reaches lived-in spaces. The first approach uses passive measures, such as sealing cracks or laying a gravel base and a polyethylene barrier under the foundation. The second, more effective approach uses active measures, such as sub-slab depressurization which employs a fan to push radon-containing air outdoors

from under the home.

Barriers exist for individuals wanting to mitigate and these are not unique to BC. Mitigation of existing homes can cost owners anywhere from a few hundred to a few thousand dollars,⁶ and there is currently a lack of certified mitigators to do the work. The implementation of premitigation building code measures can ensure that new homes are ready for active mitigation and, to a small degree, can help lower radon entry through passive measures. However, since no testing is required before occupancy, individuals may falsely assume that residential radon is not an important issue in areas where such building code measures exist. Testing should be conducted in all new homes, and if concentrations are above the Health Canada guideline, active mitigation should be instituted.

Reducing residential radon levels, and ultimately the number of radon-related lung cancer deaths, should be a public health priority. Physicians can play an important role in achieving this goal by raising awareness among their patients, particularly for children and smokers, and by encouraging them to test and reduce radon levels in their homes.

—Prabjit Barn, MSc
Environmental Health Scientist,
Environmental Health Services
—Tom Kosatsky, MD,
Medical Director,
Environmental Health Services
BC Centre for Disease Control

References on page 206

This article is the opinion of the BC Centre for Disease Control and has not been peer reviewed by the BCMJ Editorial Board.

The book lives on

Scholarly publishing is in a state of flux as electronic resources have arisen as an alternative to print. A distinct shift has occurred in the case of journals: print journal collections are dramatically declining with electronic journals becoming the standard format. The College Library is a case in point. The Library currently has switched from 400 to 20 print subscriptions and offers users access to 2500 e-journals via the College's website. But what of books? Depending on the nature of the book's content, users express preferences between print and electronic formats. A survey of UK universities showed that users prefer to read short sections of books online but prefer print for reading an entire book.¹ The online reading experience was one of very short viewing and visiting times akin to e-journal use. In a study by Folb and colleagues,² reference or pharmaceutical books seemed better suited for the electronic format. At the same time, their study's

This article is the opinion of the Library of the College of Physicians and Surgeons of BC and has not been peer reviewed by the BCMJ Editorial Board.

respondents, including clinical physicians, who were among the heaviest e-book users, demonstrated a great deal of flexibility: either format was acceptable so long as it was conveniently available at the time of need. Clearly e-books are now well entrenched in the scholarly publishing marketplace, but the utility of print persists. Accordingly, the College Library offers access to approximately 100 e-books on its website (www.cpsbc.ca/library) and continues to maintain an excellent collection of print books with a focus on clinical medicine. Borrowed books are free for College registrants to receive and return via post.

—Karen MacDonell,
Robert Melrose, Judy Neill
Library Co-managers

References

1. Nicholas D, Rowlands I, Clark D, et al. UK scholarly e-book usage: A landmark survey. *Aslib Proc* 2008;60:311-334.
2. Folb BL, Wessel CB, Czechowski LJ. Clinical and academic use of electronic and print books: The Health Sciences Library System e-book study at the University of Pittsburgh. *J Med Libr Assoc* 2011;99:218-228.

cdc continued

Continued from page 174

References

1. Chen J. Radon and lung cancer. [Presentation]. Vancouver 2012. Accessed 10 April 2012. www.bc.lung.ca/association_and_services/documents/1-JChen_000.pdf.
2. Health Canada. Government of Canada radon guideline. Ottawa 2009. Accessed 14 March 2012. www.hc-sc.gc.ca/ewh-ssmt/radiation/radon/guidelines_lignes_directrice-eng.php.

3. Schmidt D. Radon in the West Kootenays. [Presentation]. Vancouver 2012. Accessed 10 April 2012. www.bc.lung.ca/association_and_services/documents/10-DSchmidt_001.pdf.
4. Northern Health Authority. Radon. 2011. Accessed 14 March 2012. www.northernhealth.ca/YourHealth/EnvironmentalHealth/Radon.aspx.
5. British Columbia Lung Association. Initiatives - radon. Vancouver, BC: BC Lung Association; 2011. Accessed 14 March

Welcome home

Welcome to bcmj.org,
the online home of
BC physicians.

Come home to

- Get advance access to upcoming articles
- Watch video interviews with your colleagues
- Download patient information sheets
- Comment on articles instantly
- Learn what's new in medicine in BC (and beyond)
- Find back issues containing the articles you need

Fresh articles and information added regularly.

bcmj.org

The online home
of BC physicians

www.twitter.com/BCMedicalJrnl
www.facebook.com/BCMedicalJournal