

Radiation Safety Institute of Canada

Radiation Safety & Wellness Webinars

Institut de radioprotection du Canada

November 16, 2022



Energy Efficiency & Radon Making the Connection

RSIC Presenter: Lynn MacDonald Invited Guests: Dr. Anne-Marie Nicol (SFU)

Dr. Noah Quastel (BC Lung)

Pam Warkentin (CARST)

Good Science in Plain Language®



Webinar Functionality

- Audio and video
 - During the presentation, from the presenters only
 - Use computer or telephone (call in)
 - Computer seems to give the best sound quality
- Use the "Chat" feature to enter comments and questions
- Posted on webinar page
 - Video, answers to questions, copy of the slides
- Follow up email will be sent
 - Topics covered, time of attendance
- It may be possible to change your Zoom view if the controls are hiding the closed captioning.



In This Session

- Overview of what radon is
 - Properties
 - How it enters homes
 - What happens when it is inhaled
 - Health Canada Guidelines
- Guest presentation
- Interview/Question and Answers
 - Pam Warkentin (CARST)
 - Dr. Anne-Marie Nicol (SFU)
 - Dr. Noah Quastel (BC Lung)







Uranium Decay Series





Radon Properties



- Decays into several alpha and beta emitters
- Alpha emitters such as Polonium-210, Polonium-214, and Polonium-218 cause the most internal tissue damage
- Radon progeny are electrically charged
 - attach easily to dust and aerosols



Where is Radon Found?

- Builds up if not sufficiently ventilated
- Enters dwellings from the ground
- Radon can enter homes dissolved in water
 - Agitation releases it
- Very small amounts in
 - Building materials
 - Natural gas





What Happens When Radon Is Inhaled?



- Radon is inert
- Progeny are not
- Most radon will be exhaled
- Progeny will remain in lungs
- Progeny will emit alpha radiation internally
 - Damaging to living tissue
 - Carcinogen
- 2nd-leading cause of lung cancer
 - 1st amongst non-smokers
- 16% of lung cancers
 - 3200 deaths per year



How Hazardous Is Radon to the Lungs?

- Activity measured in decays per second: bequerel (Bq)
- Radon concentrations measured in Bq/m³
- In low concentrations, the risk is low
- The higher the concentration, the greater the risk
 - Proportional
- More time spent means increased risk





Lung Cancer Risk

Lifetime Risks to a Non-Smoker Exposed to Radon

- No Exposure 1%
- 200 Bq/m³ 2%
- 800 Bq/m³ 5%

Lifetime Risks to a Smoker Exposed to Radon

- No Exposure 12%
- 200 Bq/m³ 17%
- 800 Bq/m³ 30%

REPORT OF THE RADON WORKING GROUP ON A NEW RADON GUIDELINE FOR CANADA

REV. 03-10-2006

Submitted to the

FEDERAL PROVINCIAL TERRITORIAL RADIATION PROTECTION COMMITTEE

March 10, 2006



What to Do?



- Test
 - Minimum 3 months
 - Heating season
- 200-600 Bq/m³
 - Fix within 2 years
- Above 600 Bq/m³
 - Fix within 1 year



Energy Efficient Homes and Buildings



https://www.nrcan.gc.ca/energy-efficiency/homes/what-energy-efficient-home/20548

Energy Efficient Homes and Buildings







Interview

• During the interview, feel free to post questions in the chat.







Questions?

- Questions posted in the chat room
- To ask a question verbally
 - use "raise hand" button
 - When asked, press spacebar or unmute to speak
- Questions we do not get to
 - Answers will be posted to our website and link to resources emailed out





"Good science in plain language" Thank you for listening!

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info@radiationsafety.ca



Wellness Break

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References & Resources

- Canadian Association of Radon Scientists and Technologists: <u>https://carst.ca/</u>
- BC Lung Foundation Radon and Lung Health: <u>https://bclung.ca/programs-initiatives/healthy-indoor-</u> <u>environments-program/current-radon-projects</u>
- BC Lung Foundation Radon and Energy Efficiency Project: <u>https://bclung.ca/radon-and-energy-efficiency</u>
- Take Action on Radon: <u>https://takeactiononradon.ca/</u>
- Canadian Cancer Society Radon: <u>https://cancer.ca/en/cancer-information/reduce-your-risk/know-your-environment/radon</u>



References & Resources

- Health Canada Radon Gas; It's in Your Home:
- https://www.canada.ca/en/health-canada/services/environmentalworkplace-health/reports-publications/radiation/radon-your-homehealth-canada-2009.html
- Health Canada Radon Reduction Guide for Canadians: <u>https://www.canada.ca/en/health-canada/services/environmental-workplace-health/reports-publications/radiation/radon-reduction-guide-canadians-health-canada-2013.html</u>
- Report of the Radon Working Group on a New Radon Guideline for Canada (2006):

https://carst.ca/Resources/Documents/2006%20Report%20of%20the %20Radon%20Working%20Group%20in%20Canada.pdf



References & Resources

- Ji Hong Tai Chi & Qi Gong Richmond Hill: <u>https://taichiontario.com/</u>
- Instructor Charlmane Wong: <u>https://taichiontario.com/team/charlmane-wong/</u>