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## Community Health Interventions to Reduce the Burden of Radon-Related Lung Cancer

Benjamin Weaver

*The University of Vermont*

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# Community Health Interventions to Reduce the Burden of Radon-Related Lung Cancer

A Quality Improvement Project at the South Burlington Family Medicine Practice

by Ben Weaver

September, 2021

# Radon – A lesser-known cause of lung cancer

- Exposure to **radon**—an odorless radioactive gas that can be trapped in homes—is considered the second leading cause of lung cancer<sup>1</sup>
- The EPA estimates that radon exposure is responsible for about 21,000 lung cancer deaths in the United States every year<sup>2</sup>
- **One in seven Vermont homes has elevated levels of radon**<sup>3</sup>
- Many Americans are not aware of the health risks posed by radon in their homes, and even fewer have had their homes tested
- Testing for radon is inexpensive, ubiquitously available, and reliable
- Radon mitigation services are effective at reducing in-home radon burden and are relatively affordable

# Cost

- In 2021, there will be an estimated 235,760 new lung cancer diagnoses and 131,880 lung cancer deaths in the United States<sup>4</sup>
- In Vermont the incidence rate of advanced stage lung cancer among those 55 and older was 196.7 per 100,000 persons (2010-2014)<sup>5</sup>
  - This rate was higher than the national rate of 182.9 (2010-2014)<sup>5</sup>
- Initial cancer-attributable costs for a 70-year-old patient diagnosed with lung cancer treated with:
  - chemotherapy, radiation, or both ranged from \$4242 to \$8287<sup>6</sup>
  - surgery was about \$828<sup>6</sup>
  - best supportive care ranged from \$1672 to \$2991<sup>6</sup>
- Overall, cancer that is treated at an earlier stage is less expensive than cancer treated at later stages<sup>6</sup>

# Community Perspective

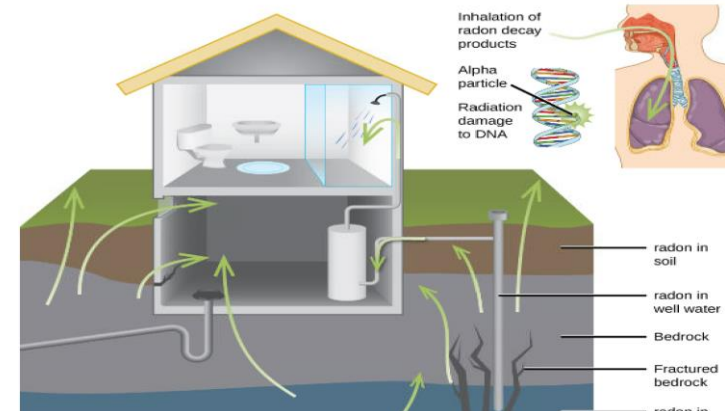
- “I want to keep my family safe first, we are planning to be here for a long time and I want to make sure they are okay”
- “To me the department of health should be mandating getting radon tested in all homes because the public health savings over time will be worth it even if they lose a marginal tax profit”

# Intervention

- A brief (two question) screening questionnaire was handed to all patients presenting to a South Burlington Family Practice
- A smart phrase was created in EPIC (.RADONPATIENTHANDOUT) and shared with the South Burlington providers to be used as a patient education resource
  - To access this SmartPhrase in UVMHC EPIC, go to SmartPhrases > Manage Phrases > Search User > Weaver, Benjamin > .RADONPATIENTHANDOUT

## Have you ever tested your home radon?

- Radon is a naturally occurring radioactive gas emitted from the Earth's crust that has no smell, taste, or color
- Radon is present in outdoor air, and radon levels can build up inside your home
- Prolonged exposure to **elevated radon levels in your home can increase your risk of developing lung cancer**, especially if you have a significant smoking history



Fortunately, there are things you can do to reduce your risk of radon exposure.

- **Radon test kits are easy to get, simple to use and inexpensive**
- If elevated radon levels are detected in your home, trained professionals can affordably help reduce it

Radon, which is measured in units of picocuries per liter (pCi/L) of air, can be found both inside and outside your house. In Vermont, the average radon level in the outside air is 0.4 pCi/L and the average level in homes is about 2.5 pCi/L.

The EPA has set 4.0 pCi/L as the action level for radon. If your test result is at or above 4.0 pCi/L, you should seek help from a certified mitigation contractor to reduce radon levels in your home. Radon levels below 4.0 pCi/L still pose some risk, but you can reduce your risk by lowering the radon level in your home. Most radon reduction systems can reduce radon levels in a home to 2.0 pCi/L or lower.

## Where can I get radon test kits?

For free long-term radon in air test kits:

- Call: 800-439-8550 (toll free in Vermont) or 802-338-4736 or 800-660-9997 (toll free in Vermont).
  - Email: [radon@vermont.gov](mailto:radon@vermont.gov)
- (Please put "Radon Test Kit" in the subject line of your email and be sure to include your name and Vermont mailing address.)

For more information about radon and what you can do about it, you can go to:

- <https://www.healthvermont.gov/radon>
- <https://www.epa.gov/radon/national-radon-action-plan-strategy-saving-lives>
- <https://www.epa.gov/radon>
- call 802-338-4736 or toll free to 800-660-9997

# Results

- Patients were receptive to the idea of getting their homes tested and possibly mitigated of radon
- Providers were appreciative of the brief screening and easy access resources for their patients
- For some, radon testing and mitigation is not a major health priority
  - i.e. many patients have more pressing health concerns
- Some patients expressed considerable anxiety when discussing that living in their home may increase their risk for lung cancer

# Effectiveness

- Asking about radon testing and acquiring resources to get it done is quick for providers and free for patients
- To assess effectiveness of the intervention, the % of homes in Chittenden & Grand Isle County could be quantified after a 1-year period
- Alternatively, patients who are given the questionnaire in office could be called later to determine if they had begun the process for testing their homes for radon
  - Then compare number of patients who received the intervention and began the process to those that did not begin the process

# Limitations

- Providers already feel burdened by the number of healthcare maintenance items they are required to manage
- While radon testing is free in Vermont, mitigation services can be a financial burden to some patients
- Patients will be less likely to test and mitigate if they do not plan to stay in a home for a short period of time
- Patients with health anxiety may be distressed to learn their home may be increasing their risk for lung cancer



# Recommendations

- Lung cancer screening with a low dose CT should be offered to patients with a smoking history  $\geq 20$  pack years OR discuss with patients screening if  $<20$  pack years AND known significant radon exposure ( $\geq 4$  picocuries per liter of air in home for  $\geq 10$  years)
- Providers should speak with their patients about getting their homes tested for radon if they have not already done so
  - This question is quick, simple, and if patients have not had their homes checked it is easy to refer them to the appropriate resources for testing and mitigation
- EPIC updates should contain a healthcare maintenance screen section for radon exposure and testing in homes
- Legislation mandating home sellers test their homes for radon and install mitigation devices if  $\geq 4$  picocuries per liter of air

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