Welcome to the January 2023 Statewide Wellness Virtual Lunch and Learn

Hosted by: OSHR Worksite Wellness

For future wellness lunch and learn events, or recordings of previous events, visit https://oshr.nc.gov/wellness-webinars.

Let’s LUNCH AND LEARN!
NC Department of Health and Human Services

Preventing Radon-Induced Lung Cancer

Phillip Ray Gibson
NC Radon Program Coordinator
NC Radiation Protection Section
NC Division of Health Service Regulation
January is National Radon Awareness Month

What is Radon? Radon is a cancer-causing radioactive gas that might be in your home. You can’t see, smell or taste it.

Radon is the second leading cause of lung cancer after smoking.

Test your home for radon today!

Radon-Lung-Cancer-Factsheet.pdf
Objectives

- What and Where is Radon?
- Why is Radon a Health Concern?
- How to Test for Radon?
- Who Needs this Information?

www.radon.ncdhhs.gov
What is Radon?

• Alpha Particle
• Naturally occurring gas
• Cannot be seen or smelled
• Primarily comes from underlying geology but can come from building materials
• Prolonged exposure increases the risk for lung cancer
What is Radon?

• During the decay process, energy is released in the form of radiation.
• Radiation can be in the form of alpha, beta or gamma emissions.
• These particles are what can lead to adverse health effects.
What is Radon?

www.radon.ncdhhs.gov
Radon can be elevated in all buildings residential and commercial.

In North Carolina, soil is the main source of radon, where it occurs naturally. There are, however, high-rise and commercial structures that are built with materials that contain uranium.

Openings, cracks in concrete slab, floor-wall joints, crawl space, or private well water.

Difference in air pressure between the home’s interior and the soil can pull radon gas into the home through the pathways.
Red: Highest level is 4 pCi/L or more

Orange: Highest Level is 2 pCi/L or more

Gray: Levels under 2 pCi/L

www.radon.ncdhhs.gov
Radon can enter your home in many ways:

- Cracks in solid floors
- Construction joints
- Cracks in walls
- Gaps in suspended floors
- Gaps around service pipes
- Cavities inside walls
- The water supply

Pathways
Air Pressure

Homes commonly operate at a lower ("negative") pressure compared to the outside air. Air pressure differences between the home and outside air create a vacuum and pull air into the home. Air can be pulled into the home through walls, windows, doors or from the soil. And soil can contain radon gas. There are three main factors that contribute to these air pressure changes.

1. **Stack Effect** – Warm air rises to the upper part of the home and is lost to the outside air. Make-up air enters the lower part of the home. Some of that make-up air comes from the soil.

2. **Down Wind Draft Effect** – Strong winds can blow over the top of the home, pushing and pulling air into and out of the house.

3. **Vacuum Effect** – Appliances (water heaters, fireplaces, clothes dryers, older furnaces, etc.) and exhaust fans remove air from the home. This can drive soil gas into the home as make-up air enters from the lower part of the house.

[Radon: Keeping you safe from radon (state.mn.us)]
Foundations

Any home can have a radon problem, no matter the type of foundation.

A basement provides a large surface area in contact with the soil, where radon can enter through different pathways. Taller homes have the potential for a greater stack effect.

Homes built slab-on-grade have many openings that allow radon to enter, similar to a basement.

Homes built with crawl spaces are directly connected to the soil and create a pathway for radon to enter the home.

Manufactured homes with solid skirting act like crawl spaces and provide a direct connection to the soil.

Radon: Keeping you safe from radon (state.mn.us)
Does my home have elevated radon?

www.radon.ncdhhs.gov
What is the Risk for Radon-Induced Lung Cancer?

What influences my risk for lung cancer?

• Average level of radon that you are exposed to
• Length of time you are exposed to that average level
• Are you a Never smoker or an Ever smoker
What is the Risk for Radon-Induced Lung Cancer?

### Lifetime Risk of Lung Cancer Death from Radon Exposure in Homes

Risk is shown per 100,000 individuals.

<table>
<thead>
<tr>
<th>RADON LEVEL (pCi/L)</th>
<th>NEVER SMOKERS</th>
<th>CURRENT SMOKERS</th>
<th>GENERAL POPULATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>3,600</td>
<td>26,000</td>
<td>11,000</td>
</tr>
<tr>
<td>10</td>
<td>1,800</td>
<td>15,000</td>
<td>5,600</td>
</tr>
<tr>
<td>8</td>
<td>1,500</td>
<td>12,000</td>
<td>4,500</td>
</tr>
<tr>
<td>4</td>
<td>730</td>
<td>6,200</td>
<td>2,300</td>
</tr>
<tr>
<td>2</td>
<td>370</td>
<td>3,200</td>
<td>1,200</td>
</tr>
<tr>
<td>1.25</td>
<td>230</td>
<td>2,000</td>
<td>730</td>
</tr>
<tr>
<td>0.4</td>
<td>73</td>
<td>640</td>
<td>230</td>
</tr>
</tbody>
</table>

Estimated risks at the EPA Action Level (4 pCi/L):
- Never Smokers: 7/1000
- Smokers: 62/1000
### Cancer Mortality 2020

<table>
<thead>
<tr>
<th>Cancer Type</th>
<th>Estimated U.S. Deaths in 2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Lung and Bronchus</td>
<td>135,720</td>
</tr>
<tr>
<td>2. Colon and Rectum</td>
<td>53,200</td>
</tr>
<tr>
<td>3. Pancreas</td>
<td>47,050</td>
</tr>
<tr>
<td>4. Breast</td>
<td>42,690</td>
</tr>
<tr>
<td>5. Prostate</td>
<td>33,330</td>
</tr>
<tr>
<td>6. Liver and Intrahepatic Bile Duct</td>
<td>30,160</td>
</tr>
<tr>
<td>7. Leukemia</td>
<td>23,100</td>
</tr>
<tr>
<td><strong>Radon-Induced Lung Cancer</strong></td>
<td><strong>21,100</strong>*</td>
</tr>
<tr>
<td>8. Lymphoma (Combined Hodgkin &amp; Non-Hodgkin)</td>
<td>20,910</td>
</tr>
<tr>
<td>9. Brain &amp; Other Nervous System</td>
<td>18,020</td>
</tr>
<tr>
<td>10. Urinary Bladder</td>
<td>17,980</td>
</tr>
<tr>
<td>11. Esophagus</td>
<td>16,170</td>
</tr>
<tr>
<td>12. Kidney and Renal Pelvis</td>
<td>14,830</td>
</tr>
<tr>
<td>13. Ovary</td>
<td>13,940</td>
</tr>
</tbody>
</table>

* The 21,100 radon-induced lung cancer deaths, based on risk estimates using U.S. demographic information from 1995, are included in the estimate of lung and bronchus cancer deaths.
2020-2025 North Carolina Comprehensive Cancer Control Action Plan

www.radon.ncdhhs.gov
### Risk Factors

Exposure to some environmental substances like radon, ultraviolet rays and asbestos can cause cancer. While people can reduce their exposure to the sun, other hazards may be harder to avoid. They are in the air, drinking water, food or materials at work. Many factors, like the amount and length of exposure and a person’s background, influence whether a person develops cancer.

- **Radon** is a naturally occurring gas that can only be detected by testing. It is found in all North Carolina counties. According to the National Cancer Institute, long-term radon exposure is the second leading cause of lung cancer in the United States. It is the leading cause of lung cancer in non-smokers.
- **Ultraviolet rays** can cause early aging of the skin and some skin cancers. Ultraviolet rays come from the sun and from artificial exposures like tanning beds and sun lamps. There are three types of skin cancer: melanoma, basal cell and squamous cell. Melanoma is the most serious form of skin cancer. It accounts for about one percent of all skin cancers but causes the most skin cancer deaths.
- **Arsenic** is a naturally occurring element which is odorless and tasteless. It can be found in smoking tobacco and contaminated water. Long-term exposure can cause bladder, skin, lung, liver, kidney and other types of cancers.
- **Cancer from benzene, beryllium, asbestos and vinyl chloride** may occur from industrial exposures. Benzene is also found in cigarette smoke.

### Preventive Actions

Minimizing exposure to environmental risk factors will reduce cancer risk.

- **Individuals**
  - Test homes, workplaces and schools for high levels of radon.
  - Mitigate, if necessary.
  - Avoid exposure to pesticides and other chemicals at home.
  - Reduce exposure to cancer-causing substances at work.
  - Use sunscreen and protective clothing when outdoors.
  - Protect children from sunburns as early sunburns may increase the risk of skin cancer in adulthood.

- **Communities**
  - Urge employers, school administrators and business leaders to test buildings for high levels of radon. Mitigate, if necessary.
  - Follow health and safety rules to avoid exposure to cancer-causing substances.
  - Urge employers to survey their workplaces to determine the workers’ exposure to chemical hazards. Correct those exposures, as necessary.
  - Urge employers to provide sun protection clothing for employees who work outside.
  - Provide shaded areas for recreation and work.
  - Use signage to encourage sunscreen use and sun protection.

Environmental exposures increase cancer risk:
- Lung
- Skin bladder
- Liver
- Kidney
Radon can be elevated in all buildings, residential and commercial.

Radon can enter your home in many ways:

- Cracks in solid floors
- Construction joints
- Cracks in walls
- Gaps in suspended floors
- Gaps around service pipes
- Cavities inside walls
- The water supply

www.radon.ncdhhs.gov
Testing is the only way to know if you have a high radon level

www.radon.ncdhhs.gov
How to Use the Test Kit
How to Use the Test Kit

Start Test

1. **Write on Kit**
   - Use a pen, not a pencil.
   - Record your device number.
   - Write your name, address, and email, placing one letter or number in each box.
   - Fill in the start day and start hour.

2. **Prepare the kit**
   - Grip securely at top and bottom.
   - Pinch gently at top until cardboard folds at part.
   - Push to ensure a snug fit all around.

3. **Hang the Kit**
   - At breathing level (2-5 ft from floor) away from drafts, heat sources, and out of direct sunlight.
   - Your thermostat would be an ideal location.

End Test

1. **Write on Kit**
   - Use a pen, not a pencil.
   - Fill in end date and end hour.

2. **Recycle**
   - Shred and cardboard or discard - do not leave inside.

3. **Seal the Kit**
   - To ensure no access.
   - Peel and remove adhesive strip.
   - Press together to form air-tight seal.

You’re Done!

Now Return Your Kit to Lab

Questions or problems? Details and videos are online: www.radon.com/instructions

3 days
Before returning the kit.

See reverse side for details.
How to Use the Test Kit

How to Use the Test Kit

1. Choose a location for your test based on the instructions provided in the manual.
2. Prepare the test kit by following the instructions for setting up and conducting the test.
3. Record the results of the test when completed.
4. Interpret the results according to the instructions in the manual.
5. Take appropriate action based on the results of the test.

IMPORTANT REMINDERS BEFORE YOUR TEST:
- Conduct your test after the “Due By” date.
- Record the serial number of your test kit.
- Place the test kit in the structure, room, and at the same temperature as the rest of your home.
- Clearly write your name on the test kit and the instructions provided.
- Test the lowest level of the structure.
- Hang the test kit from the plastic hook; do not place on a table.

DURING YOUR TEST:
- Keep ALL windows in the structure closed.
- Close all doors leading into the room.
- Do not move the test kit once it has begun.

AFTER YOUR TEST:
- Clearly fill in the serial number, date, time, and answer all questions.
- Return the test kit to the laboratory as instructed in the manual.

FREQUENTLY ASKED QUESTIONS:

WHEN IS THE BEST TIME TO TEST FOR RADON?
You can test your home for radon gas any time of the year, as long as you can maintain consistent indoor temperature levels. Keep the door closed and away from sources of heat during the test period. The test kit can be left at home for 48 hours. The radon test is not affected by weather conditions.

WHERE SHOULD THE TEST BE PLACED?
The U.S. EPA suggests testing the lowest level of your house as a regular basis, or that could be used by a potential buyer. Place the test kit in the room where you are planning to live and away from sources of heat, such as windows, doors, and vents.

AVOID testing in areas of high humidity, such as bathrooms, kitchens, laundry rooms, garages, or living areas. This is unavoidable, but no more than 4 days.

FOR REAL ESTATE TRANSACTIONS, use two kits 8 inches apart. See state-appropriate or 1% Real Estate prices.

CAN I RUN MY HEAT/AIR DURING THE TEST?
Yes, just keep the windows and doors closed. However, avoid creating a draft, as no flow of air will cause the test to fail. Follow the instructions on the label for the duration of the test.

HOW LONG SHOULD I CONDUCT THE TEST?
This test kit is designed to be left for 5 days (120 hours) and a maximum of 7 days (168 hours). Exposing it for longer than 7 days may invalidate the test.
How to Use the Test Kit
How to Use the Test Kit

**KIT PLACEMENT GUIDELINES**
More details and videos at www.radon.com/instructions

![Placement Diagram]

*Every space is different, but in general, hang the kit at eye level to knee level, avoid drafts, moisture, and direct sunlight.*

**FREQUENTLY ASKED QUESTIONS**

**WHEN IS THE BEST TIME TO TEST FOR RADON?**
You can test your home for radon gas any time of the year, as long as you can maintain Closed House Conditions. This means all windows and exterior doors should stay closed for 12 hours before and during the test period. (You can still come and go during the test, just close the doors behind you.) Important: Don’t test during severe weather - hard rains, heavy snows, strong winds.

**WHERE SHOULD THE TEST BE PLACED?**
The U.S. EPA suggests testing the lowest level used on a regular basis, or that could be used by a potential buyer. Pennsylvania residents should test the lowest LIVABLE area of a structure.

Hang the test kit around eye level where it will not be disturbed. You can use string to hang it from a central ceiling light or ceiling fan, or hang it on an interior, non-masonry wall at least 3 feet from windows, doors, hallways, exterior walls, and heat/AC vents. Keep out of direct sunlight and away from heat sources like stoves, fireplaces, and baseboard heaters.

**AVOID testing in areas of high humidity like bathrooms, kitchens, laundry rooms, closets, or damp basements. If this is unavoidable, test for no more than 4 days.**

For REAL ESTATE TRANSACTIONS, use two kits 6 inches apart. See www.epa.gov/radon for EPA Real Estate protocols.

**CAN I RUN MY HEAT/AC DURING THE TEST?**
Yes, just keep windows and doors closed. However, avoid creating a draft, so no fans of any sort (attic, ceiling, window, floor) for the duration of the test. Exception: Bathroom and kitchen fans are fine.

**HOW LONG SHOULD I CONDUCT THE TEST?**
This test kit is designed to be exposed for a minimum of 3 days (72 hours) and a maximum of 7 days (168 hours). Exposing it for shorter or longer will invalidate the test.

**IMPORTANT REMINDERS**

**BEFORE YOUR TEST**
- Conduct your test before the “Use By” date
- Record the serial number of your test kit
- Clearly fill in the start date, time, and room temperature
- Clearly write your address and email address, writing one letter or number per box
- Test the lowest livable area of the structure
- Hang the kit from the plastic hook; do not lay on a table

**DURING YOUR TEST**
- Keep ALL windows in the structure closed
- Close all doors behind you when entering or leaving
- Do not move the test kit once the test has begun

**AFTER YOUR TEST**
- Clearly fill in the end date, time, and answer all questions
- Remove and recycle the plastic hook and cardboard insert
- Seal the kit after removing the cardboard insert
- Do not tear the kit, or the brown paper envelope inside
- Return the kit to our lab as soon as possible
How to Use the Test Kit
How to Use the Test Kit
Testing Guidance

<table>
<thead>
<tr>
<th>Result (pCi/L)</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 – 1.9*</td>
<td>Retest every 2 to 5 years</td>
</tr>
<tr>
<td>2 – 3.9</td>
<td>Consider a radon mitigation system</td>
</tr>
<tr>
<td>4 or greater</td>
<td>Highly recommend a radon mitigation system</td>
</tr>
</tbody>
</table>
What Steps Do I Take if the Radon Level is High?

www.radon.ncdhhs.gov

Click on “Radon Mitigation”

Email Phillip.Gibson@dhhs.nc.gov
Reducing the Risk from Radon: Information and Interventions
A Guide for Health Care Providers

Radon Guide for Health Care Providers

www.radon.ncdhhs.gov
Talk to Your Patients

A home radon test now could prevent a positive lung cancer test later.

www.radon.ncdhhs.gov
Learn the Risks and Share Your Knowledge

Prevent Lung Cancer

www.radon.ncdhhs.gov
Radon is a Health Disparity

Those who make less income are more likely to not know about radon

NC SCHS: Statistics and Reports: BRFSS: Survey Results (ncdhhs.gov)
Radon is a Health Disparity

People of Color are less likely to know about radon gas

NC SCHS: Statistics and Reports: BRFSS: Survey Results (ncdhhs.gov)
Radon is a Health Disparity

People who rent their home are less likely to know about radon gas.

NC SCHS: Statistics and Reports: BRFSS: Survey Results (ncdhrs.gov)
Radon is a Health Disparity

People in poverty are less likely to know about radon gas

NC SCHS: Statistics and Reports: BRFSS: Survey Results (ncdhhs.gov)
Free Social Media Campaign

English & Spanish

Instagram

FaceBook

Twitter
Get Your Free Radon Test Kit

LIMITED QUANTITY!
Get a kit in person:

January 11, 2023 from 12:30 to 3 p.m.
• Dorthea Dix campus; Edgerton Building
• First floor conference room adjacent to the lobby