

RADON AWARENESS



NDAFP Big Sky Meeting
January 22, 2025


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North Dakota Medical Association



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DISCLOSURES:


- I have no disclosures.



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LEARNING OBJECTIVES:



- Understand why radon is dangerous, where it's found, and how it enters homes and buildings.
- Explain why North Dakotans are at particular risk of radon exposure.
- Define the health risks of radon exposure.
- Understand solutions to reduce elevated radon levels in homes.
- Be able to educate patients about the risks of radon exposure.



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RADON AWARENESS



- The North Dakota Medical Association adopted a policy to raise public awareness about the dangers of radon.
- The rate of lung cancer in young women is increasing in the United States, particularly in women who have never smoked.

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RADON AWARENESS

• 'It Can Happen to Anybody': Lung Cancer Survivor Shares Radon Exposure Story






https://youtu.be/ITc0hQ0XKQM?si=sR78eI-BE_V8qBe3

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RADON AWARENESS

Dr. Timothy Mullett and Lindi Campbell. Lindi is a lung cancer survivor who never smoked and grew up in a home with high radon levels.





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RADON AWARENESS




Kathy Griffin was diagnosed with Stage 1 lung cancer in 2021 and underwent left lung resection. She never smoked. Her doctors attributed her lung cancer to radon exposure.




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RADON AWARENESS




Radon is the leading cause of lung cancer in people who have never smoked.




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RADON AWARENESS



Dana Reeves (Wife of Superman, Christopher Reeves) died at age 44 from Stage IV Lung Cancer in 2006. She never smoked. 1 in 5 women who have lung cancer have never smoked.



Dustin Diamond (Screch from Saved By The Bell) died at age 44 three weeks after being diagnosed with Stage IV Lung Cancer in 2021. He never smoked. 1 in 10 men who have lung cancer have never smoked.




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RADON AWARENESS

Lung cancer diagnoses have risen 84% in women over the past 43 years while dropping 36% in men.

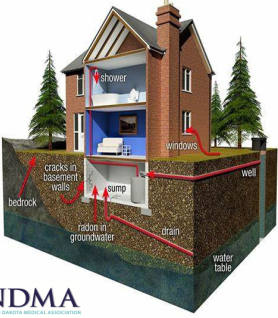
More women ages 35 to 54 were diagnosed with lung cancer at a higher rate than similarly aged men between 2000 and 2019.

Many factors may be involved in the development of lung cancer, but radon is a key toxin.




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WHAT IS RADON?



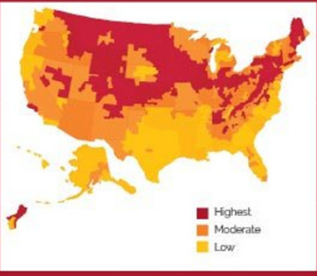


- Radon is a colorless, odorless, radioactive gas that seeps into homes and causes serious health problems.
- It is created during the natural breakdown of Uranium within the soil and rock.
- Radon is found in the soil and in water supplies and it enters homes and buildings through small cracks, holes, and sump pumps.
- Radon levels can build up and become dangerous in any building, including older homes, new construction, homes with or without basements, schools, daycares, workplaces.



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- North Dakota has some of the highest radon levels in the country, ranking #2 among all states.
- Every city and county in ND is considered high risk for radon.
- January is National Radon Awareness Month because radon levels in homes are higher in the winter.

Legend: Highest (Red), Moderate (Orange), Low (Yellow)

RADON LEVELS ⊕

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RADON FACTS

- Radon was discovered in 1899
- Half life of 3.8 days
- Radon breaks down and emits radioactive decay products.
- Average outdoor radon levels = 0.4 pCi/L
- Average U.S. indoor radon levels = 1.3 pCi/L
- EPA lists a radon level of 4.0 pCi/L as the recommended level to take action.
- 1 in 15 homes in the U.S. test above the EPA Action Level

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HOW IS RADON DRAWN INTO A BUILDING?

The diagram shows a house with radon gas (represented by red dots) entering through cracks in the foundation and walls. A vacuum system is shown drawing radon out of the house. The graph shows Radon pCi/L (red line) and Vacuum (pa.) (yellow line) over 4 days. Radon levels fluctuate between 40 and 80 pCi/L, while vacuum levels fluctuate between 10 and 20 pa.

- Vacuum
 - Exhaust systems
 - Thermal stack effects

Due to variability: No measurement that samples less than 2 days should be used to determine the need for remediation

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WHAT ARE THE RISKS OF RADON?

- Exposure to radon significantly increases the risk of lung cancer.
- Lung cancer can develop quickly 5 to 15 years after exposure.
- It takes 44 years for the radon associated-risks of cancer to decrease.

<https://www.jabfm.org/content/34/3/602>

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WHAT ARE THE RISKS OF RADON?

- Radon exposure has also been associated with:
 - Male factor infertility
 - Alzheimer's disease
 - Strokes
 - Pregnancy complications including preeclampsia and gestational hypertension.
- The risks of radon are higher in children, pregnant women, smokers, and people with chronic lung diseases such as asthma and emphysema.

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Radon Health Risk Compared to Other Common Causes of Death

- Radon kills more people in the US every year than drunk drivers!
- Radon kills more people every year than home fires.
- Think about how many homes have smoke detectors and how few homes have radon detectors.

Cause of Death	Number of Deaths Each Year
Radon	21,000
Drunk Driving	17,400
Home Accidents	8,000
Drowning	3,900
Home Fires	2,800

ACCORDING TO THE EPA, RADON CAUSES 21,000 LUNG CANCER DEATHS EACH YEAR.

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WHAT LEVELS OF RADON ARE CONSIDERED SAFE?

- The EPA recommends radon mitigation if levels are greater than 4.0 pCi/L or higher, but some organizations recommend implementing mitigation if levels are greater than 2.0 pCi/L.
- The average radon level in West Fargo homes is 7 and Grand Forks is even higher at 11 (which is 10 x the national average of 1.3)
- It is common to see levels of 16 – 30 pCi/L in our state. Levels of 100-130 have been documented.

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<small>PROTECT ENVIRONMENTAL</small> KNOW YOUR NUMBER Understand your risk from elevated radon exposure	
Radon Level 4.0 pCi/L	Equals 200 chest x-rays per year OR 8 cigarettes per day. EPA recommends: fix your home.
Radon Level 8.0 pCi/L	Equals 400 chest x-rays per year OR 16 cigarettes per day. EPA recommends: fix your home.
Radon Level 20.0 pCi/L	Equals 1,000 chest x-rays per year OR 40 cigarettes per day. EPA recommends: fix your home.

U.S. Department of Health and Human Services, Public Health Service, ARJH (1990). Toxicological profile for radon. Atlanta, GA: Agency for Toxic Substances and Disease Registry.

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RADON TESTING


- The EPA recommends testing **all homes** for radon **every two years**.
- Radon Home test kits.
- Can purchase at any hardware store.
- Inexpensive.
- Somewhat labor intensive.
- Delay to receive results.





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RADON TESTING



- Electronic radon detectors:
 - Display daily and to monitor long-term levels
 - Can be used in multiple homes/locations.
 - Easy
 - Fast – initial results within 24 hours
 - Short and long-term averages
 - Reliable




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RADON TESTS

- Place radon test kit or monitor in lowest livable area of the house.
- Place test kit at least 20 inches off the floor and three feet away from exterior doors and 10 feet away from sump pump.
- Test devices should be away from heat and areas of high humidity such as kitchens, laundry rooms or bathrooms.
- Turn off all air moving devices during the test. Including ceiling fans, dehumidifiers, regular fans, HEPA vacuums or any other kind of filtering device that moves air.
- Do not operate fireplaces or heating stoves during the test unless it's the main source of heat.
- If the furnace or central air is turned on, make sure they are set to "auto" mode.



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RADON TESTING



- Professional testing:
 - Completed by a certified home inspector or professional mitigator
- Reliable
- More expensive
- Less convenient




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DECREASING RADON LEVELS IN HOMES (MITIGATION)

There are two types of systems to decrease radon levels in homes:

1. Passive Mitigation Systems
2. Active Mitigation Systems





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PASSIVE MITIGATION SYSTEM


- A pipe extends from beneath the ground and runs through the walls to vent through the roof.
- The concept is to allow the gases to naturally-exit the home through the pipe.
- Frequently found in newer homes.

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PASSIVE MITIGATION SYSTEMS



- Homes with passive systems may still have extremely elevated radon levels.
- Many homeowners with passive mitigation systems have a false sense of security that their families are safe from radon exposure.



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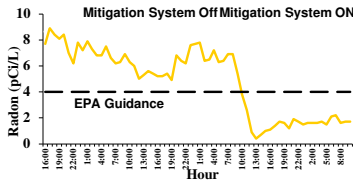
ACTIVE RADON MITIGATION SYSTEMS

- An active mitigation system operates similarly to the passive system with a pipe that vents through the roof, but an in-line fan is installed within the pipe.
- The fan assists in pulling the gas out of the house instead of relying on the passive's system of natural air flow.
- Active mitigation systems are more effective in lowering radon levels.
- Through the years, mitigation systems have continued to evolve and now offer further protection. For example, some systems have alarms that activate in the case of a system failure.
- Radon mitigation costs often are an eligible expense covered under a health flexible spending plan.

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RADON MITIGATION WORKS!



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WHAT SCREENING IS RECOMMENDED FOR PATIENTS EXPOSED TO RADON?


- Currently, there are no recommendations to screen for people exposed to high levels of radon.
- The National Comprehensive Cancer Network guidelines recommend low-dose CT screening beginning at 50 years of age for individuals with at least a 20 pack-year smoking history and documented high radon exposure.
- The United States Prevention Services Task Force and The American Cancer Society recommend annual lung cancer screening for patients who are eligible.
- The American Academy of Family Physicians concludes that the evidence is insufficient to recommend for or against screening for lung cancer with low-dose CT in persons at high risk based on age and smoking history.



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MMWR | LUNG CANCER SCREENING SAVES LIVES

Lung Cancer is #1 Cause of Cancer Deaths




Screening with low dose CT* can detect lung cancer early and save lives

More Screening is Needed



7 of 8 adults who met screening criteria did not report recommended screening

Healthcare Providers: Discuss Screening



With Adults

- ✓ Age 55-80
- ✓ Heavy smoking history**
- ✓ Smoke now or quit within the past 15 years

*Low-dose computed tomography (CT) is the only test recommended by the US Preventive Services Task Force.
**Heavy smoking is a smoking history of 30 pack-years or more. A pack-year is smoking an average of one pack of cigarettes per day for one year.
Data from BRFSS, 10 states in 2017, as reported in Richards et al., MMWR 2020 Read the full report: bit.ly/CCWA34

WWW.CDC.GOV

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RADON LAWS VARY BY STATE.

- Thirty-seven states require radon disclosure during real estate transactions.
- Four states require landlords to disclose radon levels. (ND does not).
- Nine states require radon testing in day cares. (ND does not).
- Thirteen states require radon testing in schools. (ND does not).
- Twenty-five states have radon certification laws. (ND does not).
- Seven states do not have any required radon disclosure forms including: **North Dakota**, Alabama, Arkansas, Idaho, Virginia, W Virginia, Wyoming.




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HISTORY OF RADON TESTING IN NORTH DAKOTA SCHOOLS

- Started testing radon in schools in 1989 and continued through the 1990's
- Partnership was formed to get radon testing in schools going again.
- Testing schools stopped until December 2018
- Since started in 2018 over 100 schools have been tested.



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RADON AWARENESS


- There is a deficit of radon knowledge in ND.
- Dr. David Schmitz at UND published a study (Schmitz et al., 2021) of ND residents who had called the ND Quit Line for information on quitting smoking.
 - Only 22% of people in the study knew that radon caused lung cancer.
 - Only 7% of people had learned about radon from a health care provider.
- Another study by Dr. Schmitz surveyed family physicians in ND.
 - 80% of FP physicians had never discussed radon and the combined effects with smoking with their patients.
- These researchers are looking at ways to increase awareness and distribute radon test kits through state tobacco quit lines, because smokers who are exposed to radon are at even higher risks of lung cancer.

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WHAT CAN WE DO?

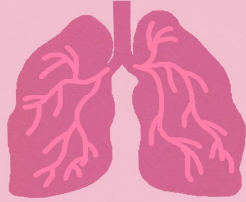
- Ask your patients if they have tested their home for radon. If they have not, inform them about the health risks posed by radon and urge them get tested.
- Add radon testing questions to the routine electronic medical record questionnaire.
- Provide/Post information in your offices and clinics that promotes radon testing and mitigation.




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Lung Cancer Prevention Tips (Even If You Don't Smoke)







Eat a wide variety of vegetables, fruits, whole grains, and legumes




Exercise regularly



Check your home for radon



Avoid secondhand smoke



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IS YOUR HOME SAFE? RADIOACTIVE RADON

RADON DEATHS

RADON IS RESPONSIBLE FOR 21 THOUSAND LUNG CANCER DEATHS IN THE U.S. ALONE PER YEAR.

During the year combination:

Source	Deaths
RADON	21,000
SMOKING (CIGARETTES)	15,000
FALLS IN THE HOME	10,000
HOME FIRES	5,000
CARBON MONOXIDE	5,000

HOW RADON AFFECTS YOUR HEALTH

AS RADON DECAYS, IT EMITS ALPHA PARTICLES THAT CAN CAUSE LUNG CANCER.

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WHAT CAN WE DO?

Become active in Medical Societies that promote radon awareness and legislation such as the North Dakota Medical Association (NDMA).

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WHAT CAN WE DO?

- In October 2023, the NDMA passed a policy to:
- Work with other ND stakeholders to submit a Radon bill for the 2025 session.
- Require residential property sellers and landlords to disclose knowledge of radon testing and mitigation in their properties.
- Provide information to buyers and tenants about the dangers of radon and importance of testing.

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To Join: <https://www.ndmed.org/membership/payndmadues/>

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RESOURCES ON RADON FOR ND RESIDENTS:

- <https://deq.nd.gov/wm/radon/>
- [Radon - North Dakota Department of Environmental Quality \(nd.gov\)](#)
- Has Radon fact sheets you can download.
- Offers free radon test kits (to the first 700 applicants).
- You can “borrow” an electronic radon monitor from the Grand Forks Public Library.
- In some clinics, patients can “borrow” an electronic radon monitor.
- Lists the companies that test for radon and offer mitigation services.
- Links to other organizations such as the American Lung Association Radon Site.

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WHAT CAN WE DO?

- Team up with the Centers for Disease Control and Prevention (CDC)-funded comprehensive cancer control program in your state. These programs have aligned the priorities, goals and activities of cancer coalitions with practices that reduce radon-induced lung cancer: https://www.cdc.gov/cancer/ncccp/ccc_plans.htm.
- Reach out to your senators and representatives to encourage legislation that supports radon education and testing.

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North Dakota Department of Environmental Quality (nd.gov)

Radon


- [Radon Fact Sheet](#)
- [EPA's Radon Site](#)
- [A Citizen's Guide to Radon \(EPA\)](#)
- [Learning about Radon: A Part of Nature \(EPA\)](#)
- [Map of Radon Zones \(EPA\)](#)
- [Basic Radon Facts \(EPA\)](#)

Facts you should know before buying a home

- [How to Protect Your Family from Radon when Buying a Newly Built Home](#)
- [Home Buyer's and Sellers Guide to Radon \(EPA\)](#)

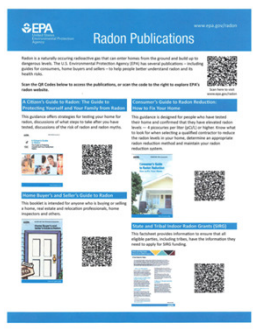
More Links...

- [EPA's Radon Site](#)
- [American Lung Association Radon Site](#)
- [National Environmental Health Association National Radon Proficiency Program \(AARST-NRPP\)](#)
- [National Radon Safety Board \(NRSB\)](#)



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Free radon test kits



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OTHER EDUCATIONAL RESOURCES:

- Educational Resources and Radon educational materials (resources, blogs, discussion forums) are available at:
 - www.radonleaders.org
 - www.epa.gov/radon
 - www.canceriowa.org/breathingeasier
- The National Radon Hotline at 1-800-SOS-RADON (1-800-767-7236).



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FOR MORE RADON INFORMATION

Justin Otto: NDDEQ Radon Coordinator
 Direct Line: 701.328.5246
 Email: jotto@nd.gov

Visit NDDEQ Web Site at:
<https://deq.nd.gov/wm/radon/>

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