Welcome
Thank you for joining us.

The webinar will begin soon.

#PACancerTrends
This webinar is a joint effort by

Pennsylvania Department of Environmental Protection
Pennsylvania Department of Health
Cancer in PA: Radon Awareness

Jointly Sponsored by the:
PA Chapter, American Academy of Pediatrics and the University of Pittsburgh
School of Medicine, Center for Continuing Education in the Health Sciences
Thank you to the American Lung Association in Pennsylvania for hosting the webinar.

We appreciate your hard work and dedication.
Moderator

Kevin M. Stewart, BSChE
Data Sources

• Healthy People 2020
• *The Burden Of Cancer In Pennsylvania* report
• US Environmental Protection Agency
• President’s Cancer Panel Radon Report
• National Cancer Institute
Radon in PA

Presenter:
Robert K. Lewis
Radon-222, Characteristics

- Naturally occurring
- Odorless, colorless, tasteless
- Gas
- Radioactive
Radon

How radon can enter a home

- Cracks
- Sump
- Drain
- Water table
- Fittings
- Radon in soil
- Bedrock
- Radon in well water
- Fractured bedrock

Diagram showing how radon can enter a home through cracks, sump, drain, and water table.
Radon Levels

4 pCi/L action level U.S.

0.4 pCi/L Outdoor average U.S.
1.3 pCi/L Indoor average U.S.

7 pCi/L Basement average in PA
3.5 pCi/L First floor average in PA

> 5,000 PA test results over 100 pCi/L
Pennsylvania is unique!

The geology and the soil contribute to PA having some of the highest radon levels in the country

Basements of PA homes average about twice the EPA action level of 4 pCi/L

In PA, approximately 40% of radon test results are greater than the EPA action level
## Statewide Data

<table>
<thead>
<tr>
<th>Radon Level (pCi/L)</th>
<th>Statewide Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 4 pCi/L</td>
<td>60.8 %</td>
</tr>
<tr>
<td>&gt; 4 pCi/L</td>
<td>39 %</td>
</tr>
<tr>
<td>Sample Size</td>
<td>878,600</td>
</tr>
</tbody>
</table>
## Annual Radiation Dose

<table>
<thead>
<tr>
<th></th>
<th>U.S.</th>
<th>PA</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Radon</td>
<td>228 mrem/yr</td>
<td>988 mrem/yr</td>
<td>760 mrem/yr</td>
</tr>
<tr>
<td>Total Dose*</td>
<td>620 mrem/yr</td>
<td>1,320 mrem/yr</td>
<td>700 mrem/yr</td>
</tr>
</tbody>
</table>

*Radiation from other sources such as medical procedures, occupational exposure are included in total dose, along with radon.

NRCP 160/PA DEP (March 2009)
Life’s Radon Sources

Homes       Schools       Work
If 1000 people are exposed over a lifetime* the number that could get lung cancer is:

<table>
<thead>
<tr>
<th>Radon Level</th>
<th>Non-smoker</th>
<th>Smoker</th>
</tr>
</thead>
<tbody>
<tr>
<td>20 pCi/L</td>
<td>36</td>
<td>260</td>
</tr>
<tr>
<td>10 pCi/L</td>
<td>18</td>
<td>150</td>
</tr>
<tr>
<td>8 pCi/L</td>
<td>15</td>
<td>120</td>
</tr>
<tr>
<td>4 pCi/L</td>
<td>7</td>
<td>62</td>
</tr>
<tr>
<td>2 pCi/L</td>
<td>4</td>
<td>32</td>
</tr>
<tr>
<td>1.3 pCi/L</td>
<td>2</td>
<td>20</td>
</tr>
</tbody>
</table>

* Assumes 70 years and 18 hours per day = lifetime
Risk Graph

Non-smoker  Smoker

Radon Exposure

1.3 pCi/L  2 pCi/L  4 pCi/L  8 pCi/L  10 pCi/L  20 pCi/L
Why Radon is important to Physicians

1) Not part of my medical school curriculum fifteen years ago

2) Need a better answer than “I’m not sure”, when patients stated “How did I get lung cancer…. I never smoked?”

3) Knowledge if radon’s impact on lung cancer essential to those that care for lung cancer patients.
Radon Health Concerns

Class A carcinogen

Lung cancer only confirmed health effect
How Radon Causes Lung Cancer

Inhalation of Radon Decay Products

Alpha Particle

Radiation Damage to DNA
Cancer Facts

Most people know that smoking is the #1 cause of lung cancer.

They don’t know that radon is the #2 leading cause of lung cancer.
And radon is the #1 Cause of lung cancer in Non-smokers
Annual Radon-Related Deaths

Source: EPA 09/2007
Radon is a National Health Problem!

Recognized by:

American Cancer Society
American Lung Association
American Medical Association
American Public Health Association
U. S. Environmental Protection Agency
U. S. Surgeon General
## 2008 President’s Cancer Panel Radon Report

<table>
<thead>
<tr>
<th>Cancer Type</th>
<th>Estimated U.S. Deaths/Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Lung</td>
<td>161,840</td>
</tr>
<tr>
<td>Lung – Radon-induced</td>
<td>21,000</td>
</tr>
<tr>
<td>2. Colon</td>
<td>49,960</td>
</tr>
<tr>
<td>3. Breast</td>
<td>40,930</td>
</tr>
<tr>
<td>4. Pancreatic</td>
<td>34,290</td>
</tr>
<tr>
<td>5. Prostate</td>
<td>28,660</td>
</tr>
<tr>
<td>6. Leukemia</td>
<td>21,710</td>
</tr>
<tr>
<td>7. Non-Hodgkin Lymphoma</td>
<td>19,160</td>
</tr>
<tr>
<td>8. Liver</td>
<td>18,410</td>
</tr>
<tr>
<td>9. Ovarian</td>
<td>15,520</td>
</tr>
</tbody>
</table>
Radon Health Facts

There is no confirmed “safe level” of radon exposure.

Demonstrated lung cancer risks to underground miners occur at radon levels that clearly overlap with exposures frequently experienced in Pennsylvania.

Pooled residential studies published in 2004 to 2006 confirm an increase in lung cancer risk on the order of 10 percent at the 2.7 pCi/L level – not a safety standard.
Radon-Related Deaths

The EPA has estimated that one in seven lung cancer deaths are radon-related
### 5 Year Cancer Survival Rate

<table>
<thead>
<tr>
<th>Type of Cancer</th>
<th>2005-2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breast</td>
<td>89.4%</td>
</tr>
<tr>
<td>Prostate</td>
<td>98.9%</td>
</tr>
<tr>
<td>Colon</td>
<td>64.6%</td>
</tr>
<tr>
<td>Lung</td>
<td>17.4%</td>
</tr>
</tbody>
</table>

More people die from Lung Cancer than Breast, Prostate and Colon combined. It is estimated that 25% of non-smoking women who contract lung cancer can be attributed to their exposure to radon.

Source: National Cancer Institute, 2012
Lung Cancer Incidence 2000-2011

Lung and bronchus cancers, age-adjusted incidence rates by sex and race, Pennsylvania residents, 2000-2011

NOTES: Age-adjusted rates are computed by the direct method using the 2000 U.S. standard million population. Incidence rates based on invasive cancers. Rates based on less than 10 events are considered statistically unreliable and are not displayed. Cancer primary site/type groupings follow the definitions used by the National Cancer Institute’s SEER program.
Lung and bronchus cancer deaths, age-adjusted rates by sex and race, Pennsylvania residents 2000-2011

NOTES: Age-adjusted rates are computed by the direct method using the 2000 U.S. standard million population. Rates based on less than 10 events are considered statistically unreliable and are not displayed. Cancer primary site/type groupings follow the definitions used by the National Cancer Institute’s SEER program.
Male lung cancer incidence, 2007-2011 Significant differences between Pennsylvania county and state age-adjusted rates
Female lung cancer incidence, 2007-2011

Significant differences between Pennsylvania county and state age-adjusted rates

The symbol, □, represents the number of invasive cancers. A larger circle indicates a larger amount of cases.

Note: Age-adjusted rates are per 100,000 and computed by the direct method using the 2000 U.S. standard million population. Rates based on less than 20 events are considered statistically unreliable.
Male lung cancer deaths, 2007-2011 Significant differences between Pennsylvania county and state age-adjusted rates
Female lung cancer deaths, 2007-2011 Significant differences between Pennsylvania county and state age-adjusted rates
Burden and Challenges of Lung Cancer

- 75% of all lung cancers are diagnosed at late stage
- Lung cancer counts for 26% of all cancer deaths in PA
Preventing Lung Cancer

Don’t smoke

• Smoking, cigar smoking, secondhand smoke exposure increase cancer risk

Get your home tested for radon

• Second leading cause of lung cancer

Protect from workplace exposures

• Asbestos, radioactive ores, inhaled chemicals or minerals, diesel exhaust
Radon Call to Action

Presenter:
Alan Peterson, MD

Lancaster General Health
Lung cancer is a very preventable cancer. Stop smoking and test for radon.

We must invest time, energy, and money NOW to prevent lung cancer!

In addition to saving lives, the return on investment in preventing costly healthcare burden is compelling.
Call to Action

“Have you tested your home for radon?”

Physicians and Healthcare Professionals-

Start the discussion
Ask the question
Include it with the tobacco question

Help prevent Lung Cancer!
The Goal

Add radon to your EHR system

Tobacco Status

- [ ] Currently Uses
- [ ] Has Quit
- [ ] Never used

What type(s)?
- [ ] Cigarettes
- [ ] Pipe
- [ ] Cigars
- [ ] Smokeless

How many years?

Amount/Packs per day:

Radon

Have you had your home tested for radon?
- [ ] Yes
- [ ] No
Radon can be present in any home
Are the hospitals and birthing centers participating in the Newborn Program? For information, call 717-783-3594

Test kit quantities are limited *
Radon Handouts

Trifold document available for distribution at your office.

Call to order:
1-800-23RADON

Download Radon Resources document from Handouts section for a web link to this resource.
Radon Handouts

One page information sheet available for distribution at your office.

Health Effects of Radon

Call to order: 1-800-23RADON

Download Radon Resources document from Handouts section for a web link to this resource.
High radon levels can be fixed

Contact DEP  1-800-23RADON
Annals of the ICRP
Radiological Protection against Radon Exposure
Lung Cancer Risk for Indoor Exposures to Radon Daughters
Lung Cancer Risk from Radon and Progeny, and Statement on Radon

BEIR VI – Health Effects of Exposure to Radon

EPA Assessment of Risks from Radon in Homes

NCRP Report No. 160
Ionizing Radiation Exposure of the Population of the United States

UNSCEAR Volume II: 2006 Effects of ionizing Radiation Annex E
Sources-to-Effects Assessment for Radon in Homes and Workplaces

WHO Handbook on Indoor Radon

Download Radon Resources document from Handouts section for web links to these resources
For additional CEUs and radon information:

www.siumed.edu/cpd
Click on Online Courses

<table>
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<th>Module</th>
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<tr>
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</tr>
<tr>
<td>Module #5</td>
<td>$15</td>
<td>.75 CEU</td>
</tr>
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</table>

Southern Illinois University School of Medicine
• Radon remains a serious issue
• Everyone should test
• Some areas are worse than others
• Our work is not finished
More State Cancer Data

PA Bureau of Health Statistics and Registries
http://www.statistics.health.pa.gov

Listing of publications on PA cancer statistics
http://www.statistics.health.pa.gov/HealthStatistics/CancerStatistics/Pages/default.aspx#.Vo1WbmQo6Uk

EpiQMS
Questions & Answers
Thank you for attending today’s webinar.

Please take a moment and complete the survey as you exit.

The survey is required for any who wants to receive CMEs.