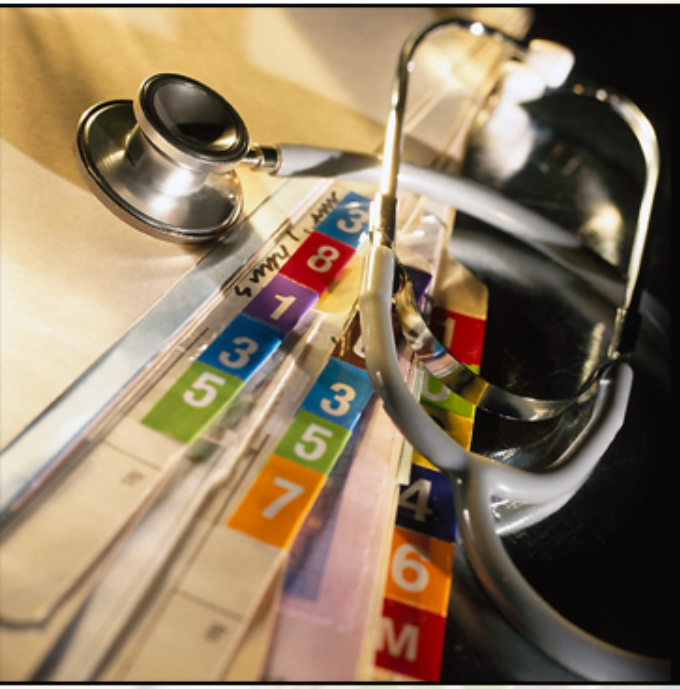

What *IS* Radon (Rn) and Why Should We Care?

Brandy Toft
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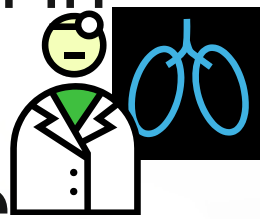
Leech Lake Band of Ojibwe

February 27th, 2013

What Is Radon?

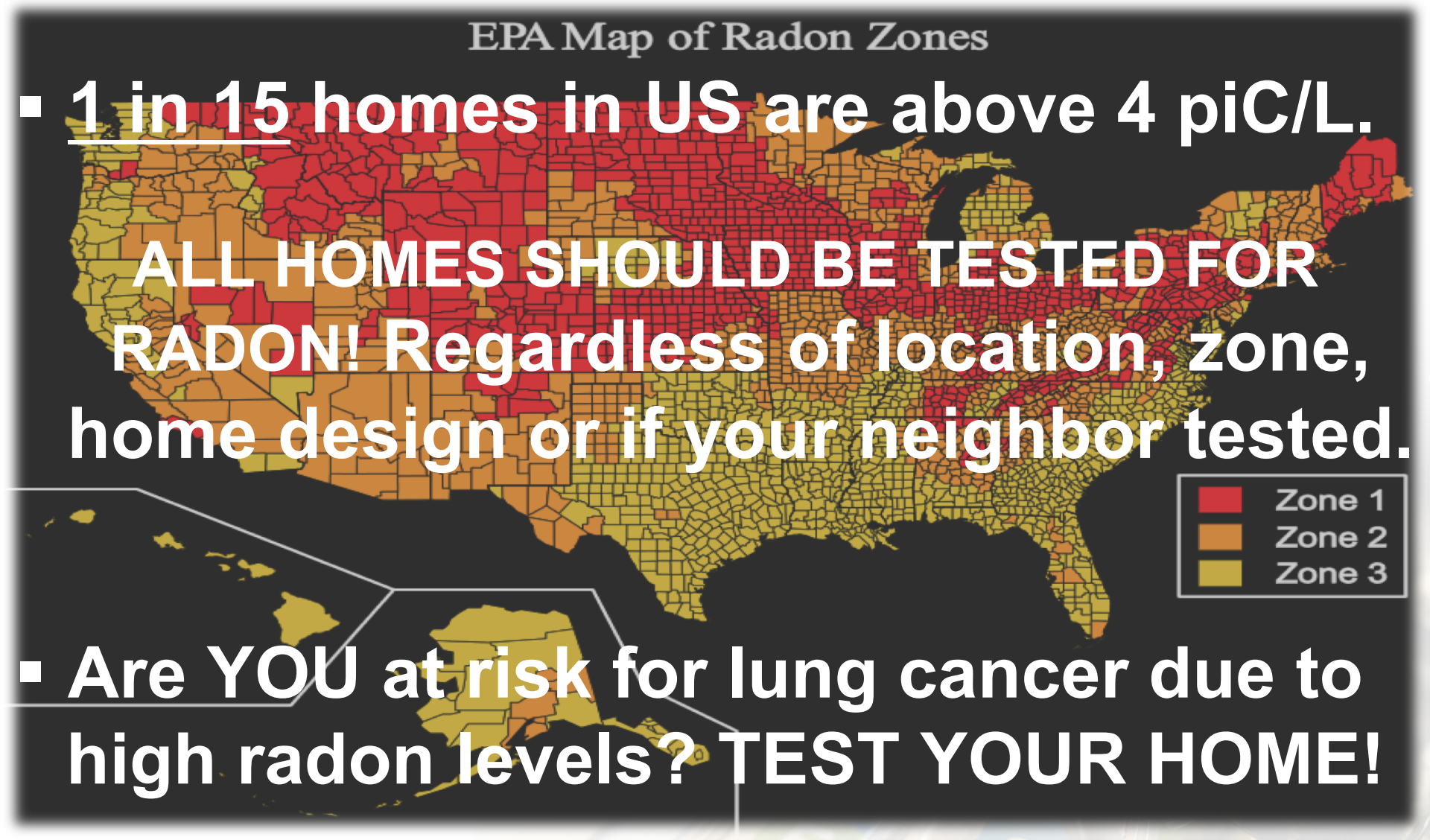


- Radon is an odorless, colorless, toxic gas that is derived from the decay of uranium in the soil.
- Form of radiation that attacks lung tissue.
- Radon is the # 1 cause of lung cancer among *non*-smokers.
- Smoking ***increases*** your risk 4 times!
- Estimated 21,000 deaths a year and rising.
- Elevated indoor levels found in every state.

Where Does Radon Come From?

- Radon is the caused by a breakdown of Uranium in the earth's crust. It is present in almost all rock, soil, and water.
- The amount of radon in the soil depends on soil chemistry, which varies greatly from one house to the next.
- Radon moves up through the ground into the atmosphere where it can potentially enter your home through cracks/holes in your home's foundation.

Could My Home Have Radon?



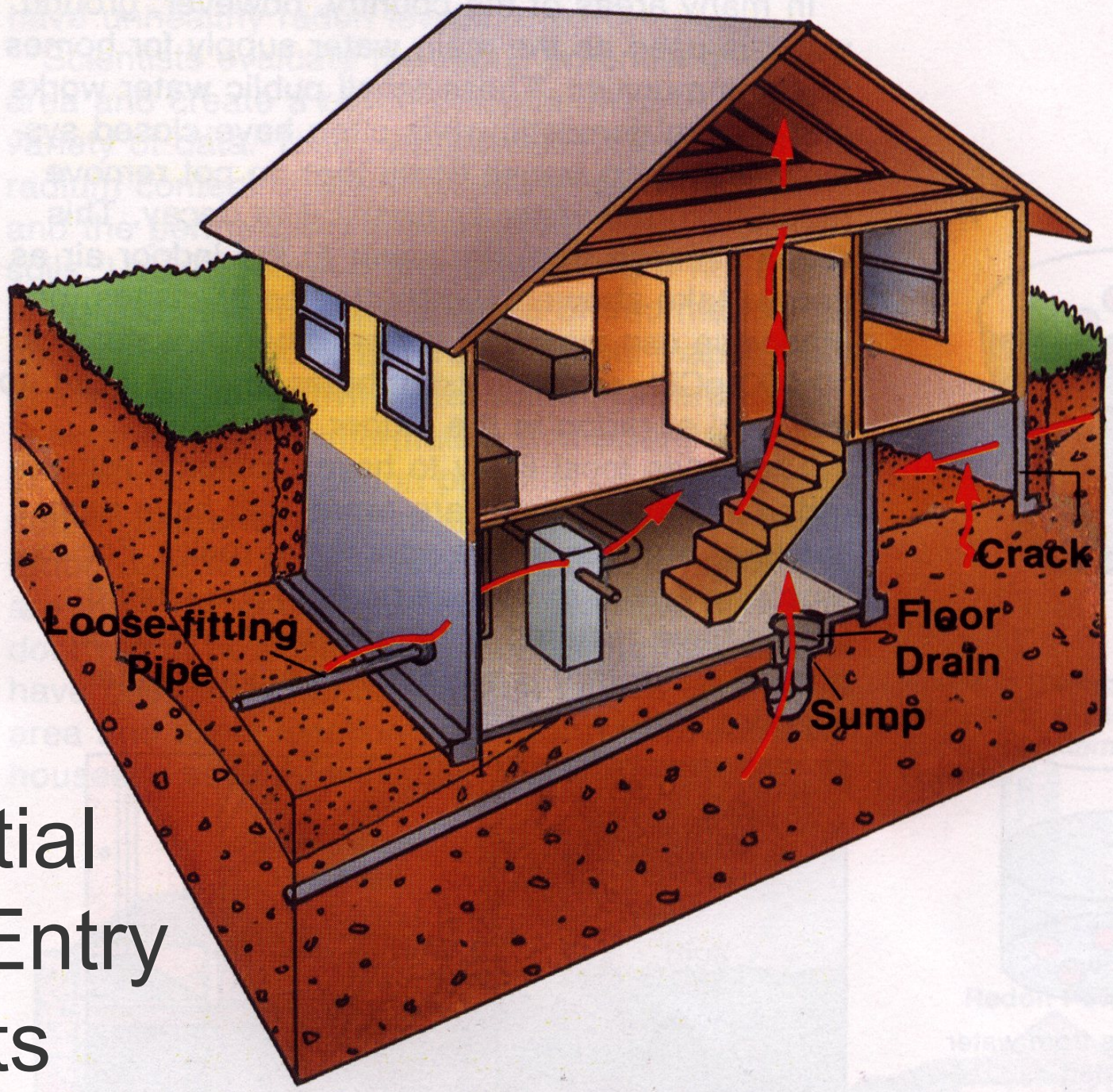
- 1 in 15 homes in US are above 4 piC/L.

ALL HOMES SHOULD BE TESTED FOR RADON! Regardless of location, zone, home design or if your neighbor tested.

- Are YOU at risk for lung cancer due to high radon levels? TEST YOUR HOME!

Houses Suck…

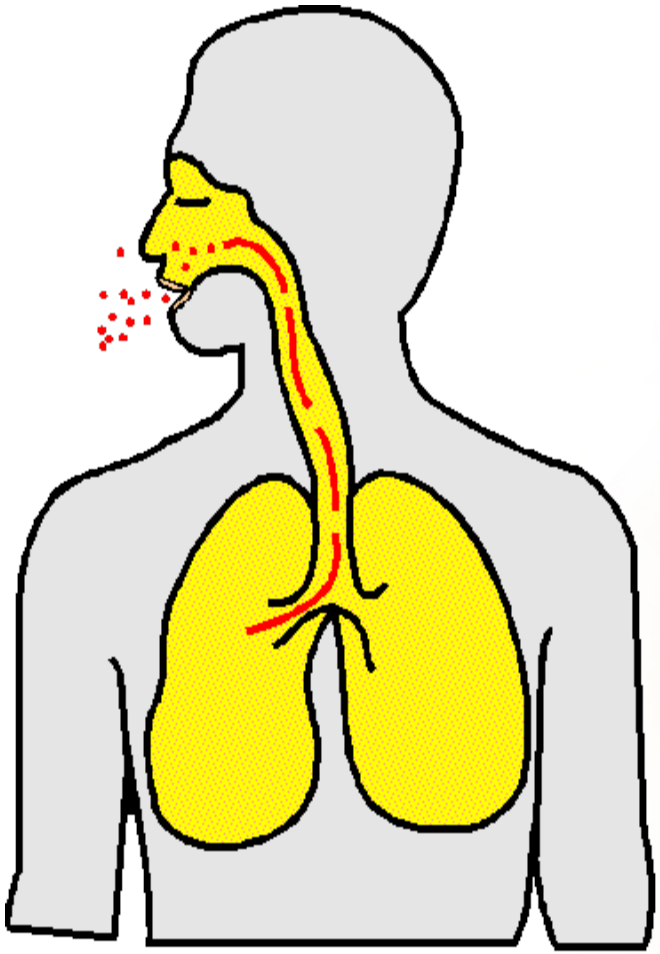
Potential Radon Entry Points



Examples of Entry Points

- Cracks in concrete slabs.
- Spaces behind brick veneer walls that rest on uncapped hollow block foundations.
- Pores and cracks in concrete blocks.
- Floor-wall joints (cold joints).
- Exposed soil, as in a sump or crawl space.
- Weeping (drain) tile, if drained to an open sump.
- Mortar joints.
- Loose fitting pipe penetrations.
- Open tops of block walls.
- Building materials, such as brick, concrete, rock.
- Well water.

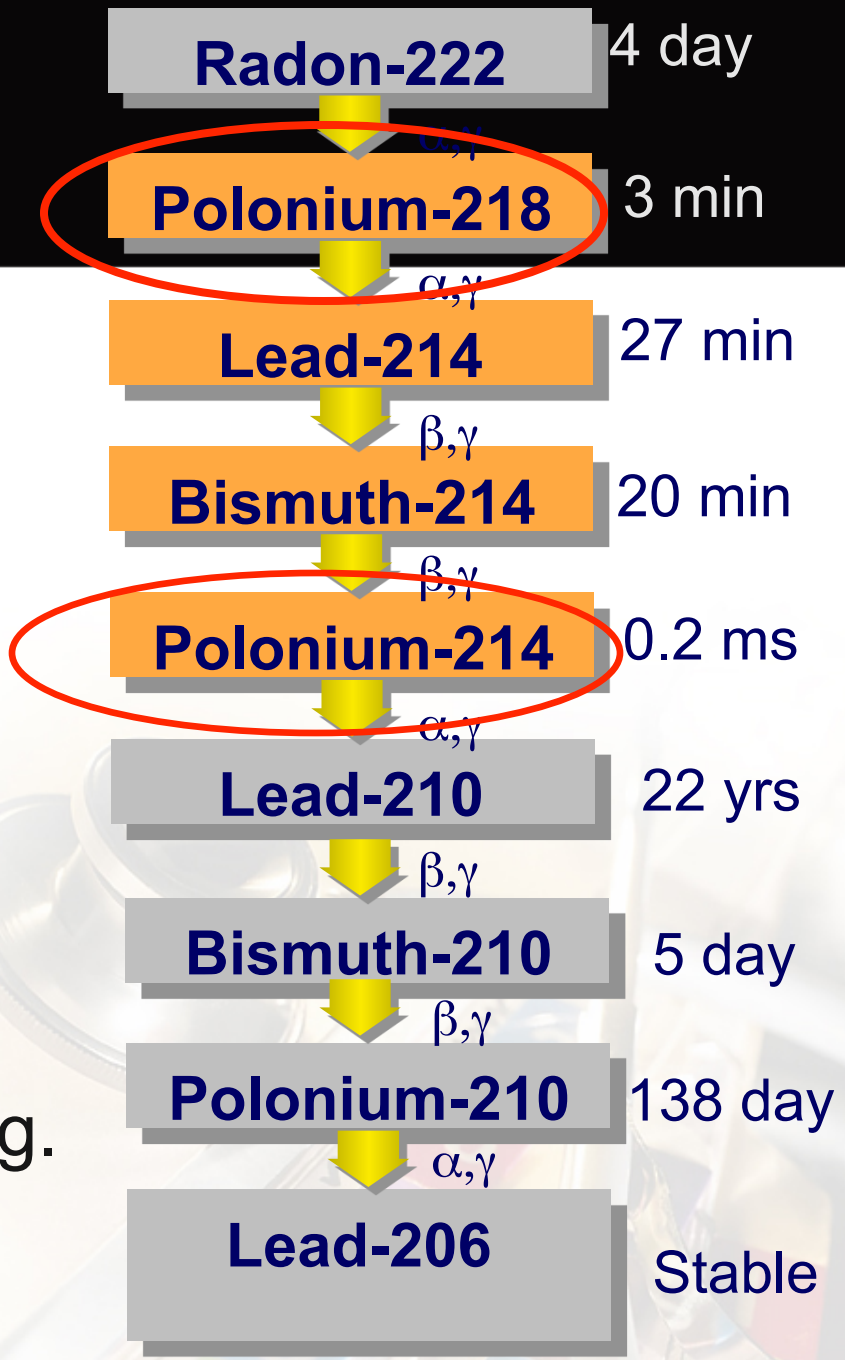
Radon is a Lung Cancer Causing Gas



- Radon decays into radioactive alpha particles.
- These particles are inhaled and deposited in the lungs.
- Causes physical damage to DNA, increasing the potential for cancer.

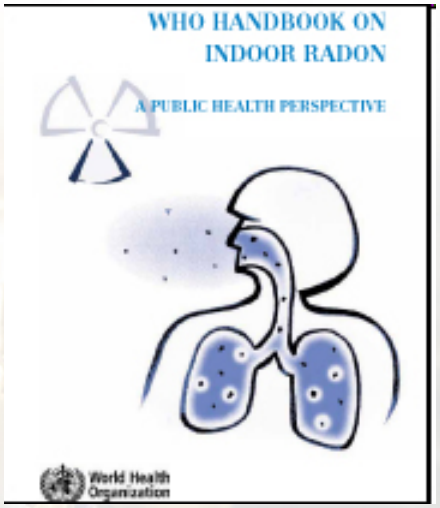
Radon Decay Products

Po-218 and Po-214 deliver the majority of radiation dose to the lung.



What Level of Rn is Considered Safe?

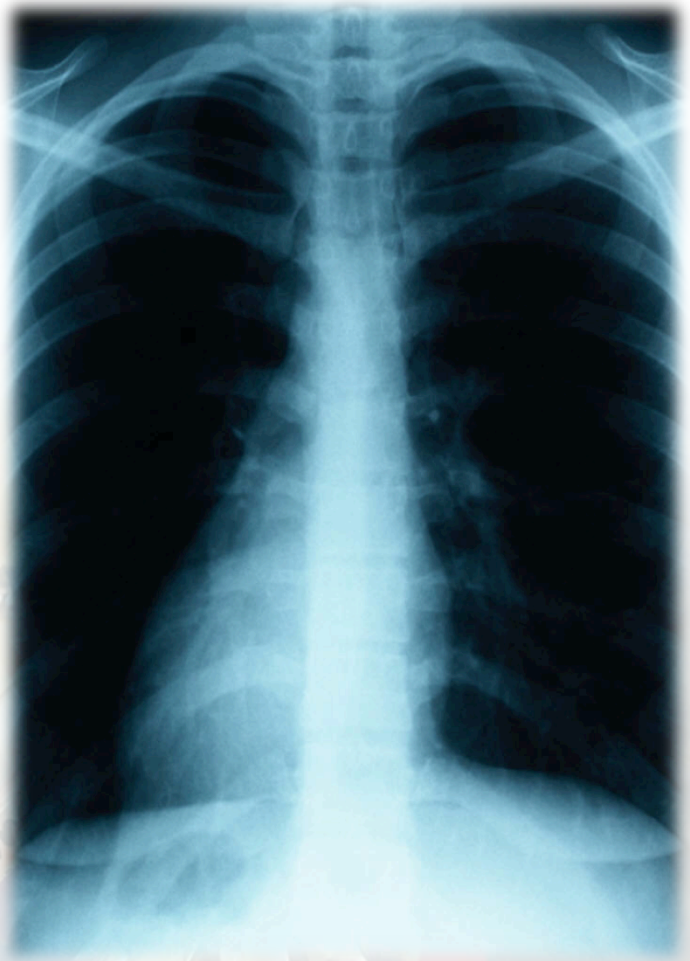
- There is ***no known safe level*** of radon
- 9 to 12% of lung cancers are radon induced
- EPA recommends homes with radon levels over 4 pCi/L be mitigated
  - Not a health based standard
  - Based on mitigation technology



- WHO *health* based action level 2.7 pCi/L

Health Effects Of Radon

- 2nd leading cause of lung cancer in the United States
  - Estimated to cause 21,000 deaths annually*
  - Second only to smoking
- Leading cause of lung cancer for non-smokers
  - 2,900 deaths annually



* EPA Assessment of Risks from Radon in Homes (June 2003, EPA -402-R-03 -0003)

Health Effects

Radiation is a carcinogen(cancer causing agent).

Most of these cancers do not appear until many years after the radiation dose *(~10-40 years)*.

- Radiation *may* also cause other health effects:
  - links to leukemia, stomach and liver cancer
  - exposure during pregnancy potential links
    - genetic defects in children
    - mental retardation

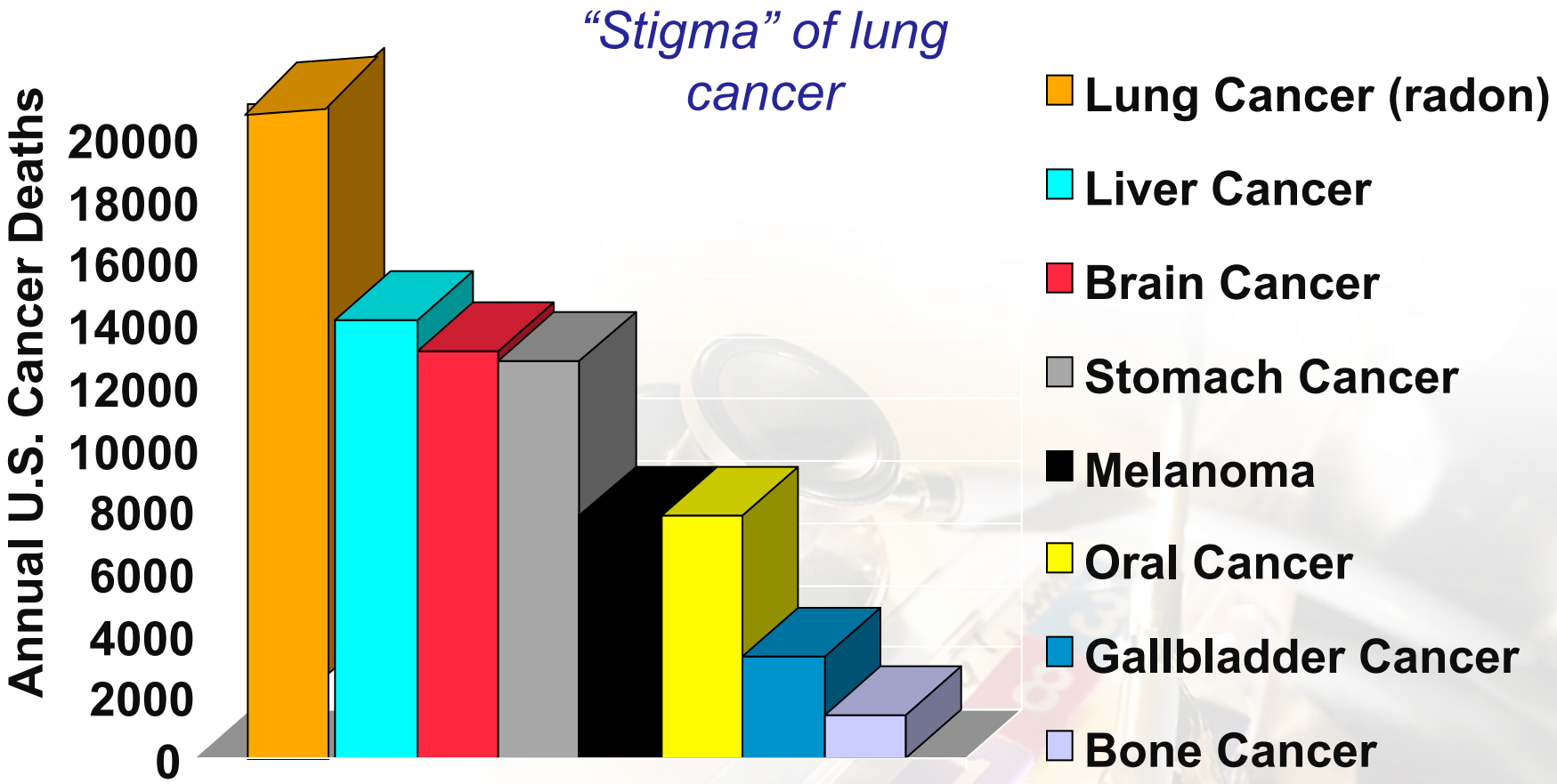
Radon and Health

- Most radon-induced lung cancer occurs *below* EPA's action level (4piC/L mitigation level based)
- Radon exposure increases the risk of *all* types of lung cancer
- Prevention/mitigation methods reduce the risk

Chances Of Developing Cancer Due To Radon Depend On:

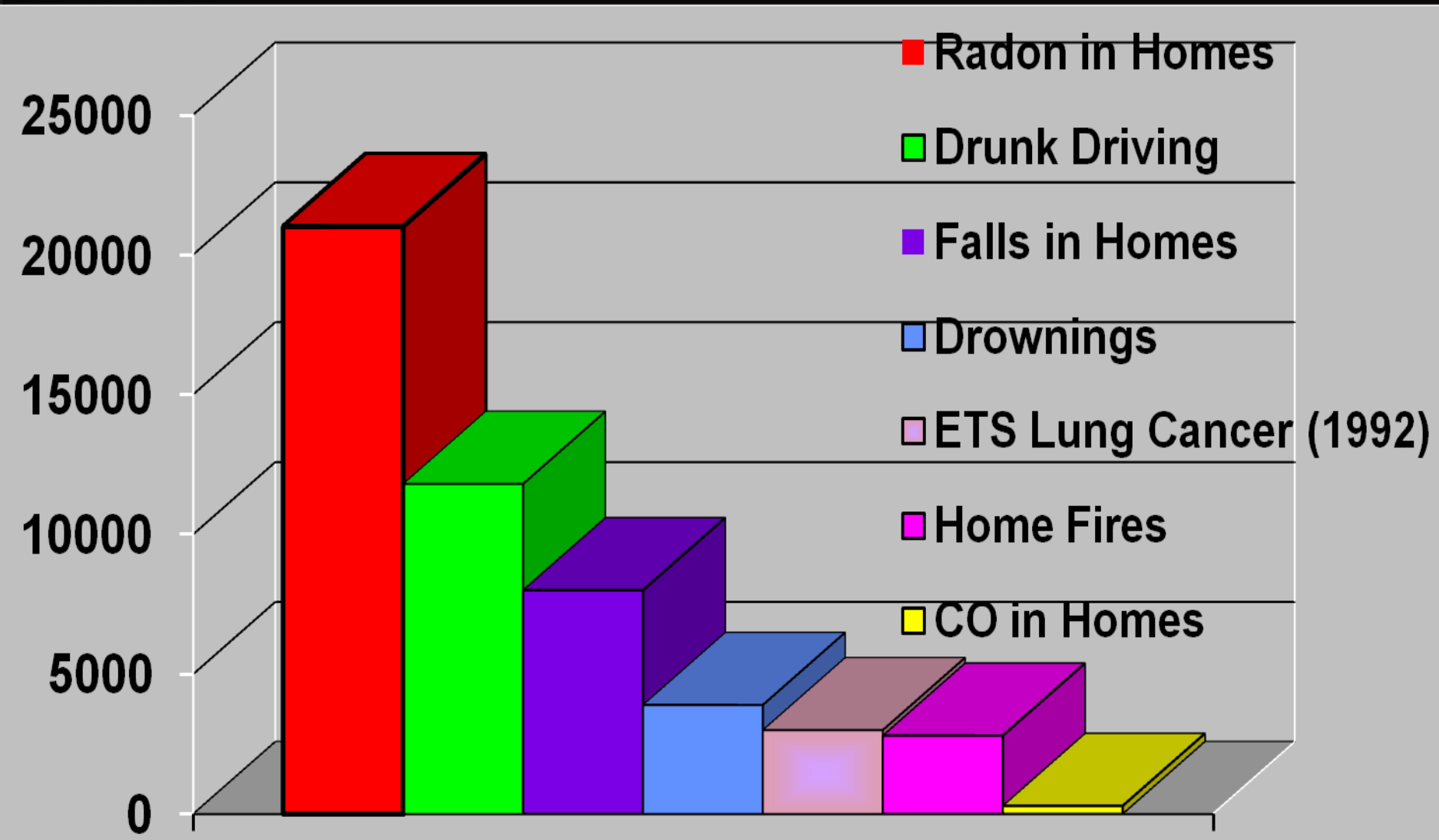
- The levels of radon in the home - Dose
- Amount of time spent in the home - Duration
- Pre-Disposition
  - Smoker
  - Non-smoker
  - Previous Smoker
  - Genetics

Comparing Radon Related Cancer to Other Cancer Types



Source: Bill Field, 2005, UI

Radon Compared to Other Risks



Radon Level Non Smoker	If 1,000 people who never smoked were exposed to this level over a lifetime*…	The risk of cancer from radon exposure compares to**…	What to Do:
20 pCi/L	About 36 people could get lung cancer	35 times the risk of drowning	Fix your home
10 pCi/L	About 18 people could get lung cancer	20 times the risk of dying in a home fire	Fix your home
8 pCi/L	About 15 people could get lung cancer	4 times the risk of dying in a fall	Fix your home
4 pCi/L	About 7 people could get lung cancer	The risk of dying in a car crash	Fix your home
2 pCi/L	About 4 people could get lung cancer	The risk of dying from poison	Consider fixing between 2 and 4 pCi/L
1.3 pCi/L	About 2 people could get lung cancer	(Average indoor radon level)	(Reducing radon levels below 2 pCi/L is difficult)
0.4 pCi/L		(Average outdoor radon level)	

Radon Level SMOKERS	If 1,000 people who smoked were exposed to this level over a lifetime*...		The risk of cancer from radon exposure compares to**...	What to Do:
20 pCi/L	About 260 people could get lung cancer	-	250 times the risk of drowning	Fix your home
10 pCi/L	About 150 people could get lung cancer	-	200 times the risk of dying in a home fire	Fix your home
8 pCi/L	About 120 people could get lung cancer	-	30 times the risk of dying in a fall	Fix your home
4 pCi/L	About 52 people could get lung cancer	-	5 times the risk of dying in a car crash	Fix your home
2 pCi/L	About 32 people could get lung cancer	-	5 times the risk of dying from poison	Consider fixing between 2 and 4 pCi/L
1.3 pCi/L	About 20 people could get lung cancer		(Average indoor radon level)	(Reducing radon levels below 2 pCi/L is difficult)
0.4 pCi/L			(Average outdoor radon level)	

TEST, FIX, SAVE A LIFE.

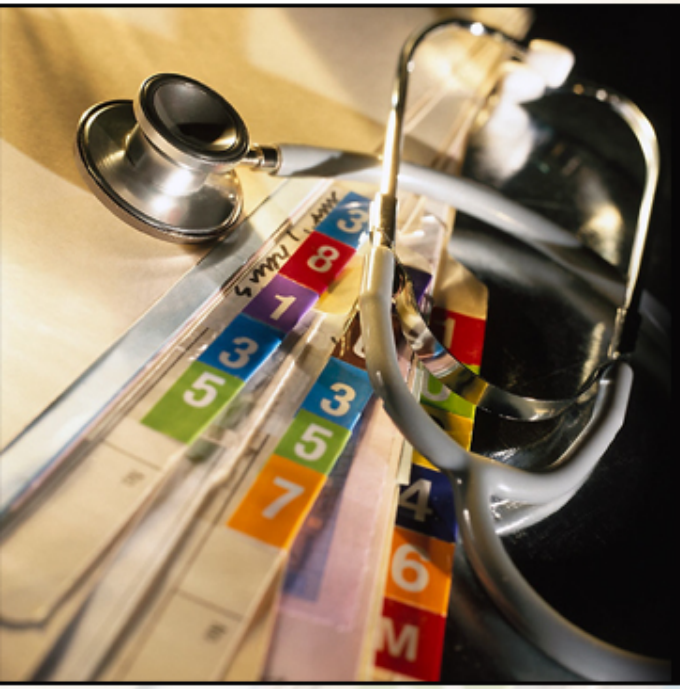
Every home should be tested

- Testing is easy
  - No special skills required
  - Only takes a couple of minutes to set
- It's inexpensive!!!
  - Especially when compared to medical treatment

TEST TEST TEST TEST TEST

Adverse health effects of radon will increase as more people are:

- ✓Exposed in homes and work,
- ✓Our population ages, and
- ✓Increased medical-related radiation exposure



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