

Can Radon Put You at Risk for Brain cancer, Alzheimer's Disease, and Parkinson's Disease?

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In a study conducted at the University of North Dakota, researchers discovered that the concentrations of radioactive radon daughters in the brains of non-smoking persons with Alzheimer's and Parkinson's disease averaged about *10 times greater* than in the brains of persons with no previous evidence of neurological disorders. Professor Glenn Lykken and Dr. Berislav Momcilovic assert their study demonstrates that indoor radon gas has the capacity to irreversibly infest the brain with the poisonous progeny of radioactive heavy metals.

Recently revised EPA risks assessments estimate 21,000 Americans die annually from radon induced lung cancer, 150% higher than their 1994 estimate. However, scientists are increasingly suspicious that radon may be linked to disease in other parts of the body as well.

When inhaled, radon gas accumulates in lipid tissue throughout the body with the highest concentration in the brain, bone marrow, and nervous system. Additionally, one-third of the inhaled radon decay products (radioactive particles produced when the gas decays) pass from the lungs into the blood stream indicating that the gas does not flow quickly in and out of the lungs, but lingers in the body.

Previous studies at UND determined that once radon is rapidly absorbed into the body from the lung, it accumulates in the cranium resulting in increased gamma ray emissions from bismuth-214 (one of the radioactive radon decay products) and altered EEG signals.

While radon is a lipid-soluble gas that can move freely in and out of the brain despite the blood-brain barrier, none of the transmuted heavy metal radon daughters are soluble in the lipids, meaning they remain trapped in the brain where they emit gamma radiation and alpha particles resulting in both radiation and chemical injury to the brain cells.

Of keen interest was the unexpected discovery that the radioactivity selectively accrues to the brain *proteins* in the Alzheimer's victims and to the brain *lipids* in the Parkinson's victims. This pathognomonic distribution was inferred to reflect the increase of local chlorine availability to which the radon daughters bound selectively.

Once present, the most likely candidate for radiation injury appears to be the highly radiosensitive astrocytes rather than the more radio-resistant neurons, which do not divide. Other studies have indicated the astrocytes may be involved in Alzheimer's disease and the amyloid deposits and neurofibrillary tangling observed with Alzheimer's may well reflect the response to radiation injury of the astrocytes.

An estimated 4.5 million Americans have Alzheimer's disease, the number having doubled in the last 25 years. An estimated 1.5 million Americans have Parkinson's disease with 60,000 new cases diagnosed each year.

[Radon mitigation not only protects health, it also helps to keep basements dry and air conditioning costs low by greatly reducing entry of water vapor from the soil.](#)

Interestingly enough, *the geographic distribution of Parkinson's disease mortality is considerably higher in states with a greater radon potential*, according to research by

D.J. Lansak of the University of Kentucky and published in the Journal of Neurological Sciences.

For further information about the study see

<http://healthandenergy.com/images/ADAD01Art.pdf>. Visit the Alzheimer's Association's Internet site (<http://www.alz.org>). Visit the Parkinson's Disease Foundation's Internet site (<http://www.pdf.org>). You may contact: Professor Glenn I. Lykken at the University of North Dakota by phone (701) 777-3519 or E-mail: glenn_lykken@und.nodak.edu .

Radon is measured in picoCuries

A picoCurie is 0.000,000,000,001 (one-trillionth) of a Curie, an international measurement unit of radioactivity. One picoCurie per liter (pCi/L) means that in one liter of air there will be 2.2 radioactive disintegrations each minute. For example, at 4 pCi/L, EPA's 'Action Level', there are approximately 12,672 radioactive disintegrations in one liter of air, during a 24-hour period.

Alzheimer's Disease

Research findings published in Archives of Neurology (Aug. 18, 2003) predict that the prevalence of Alzheimer's Disease will increase 70 percent by 2030 affecting more than 7.7 million people. This increase is the result of the rapid growth of the 85+ age group, the vast majority of who are women (63 percent).

Radon is a primary source of harmful radiation exposure for humans; it decays in a cascade of daughters (RAD) by releasing the cell damaging high energy alpha particles. The ubiquitous environmental RAD exposure, and high RAD accumulation in the sensitive brain structures may either induce or hasten or both the irreversible "shut down" process of the ailing human brain in AD.

Ten Warning Signs of Alzheimer's Disease

1. Memory loss: dementia such as forgetting things more often and not remembering them later.
2. Difficulty performing familiar tasks: May forget the steps for preparing a meal, using a household appliance, or participating in a lifelong hobby.
3. Problems with language: Forgets simple words or substitutes unusual words, making his or her speech or writing hard to understand.
4. Disorientation to time and place: May become lost on their own street, forget where they are and how they got there, and not know how to get back home.
5. Poor or decreased judgment: May dress without regard to the weather, show poor judgment about money, giving away large amounts of money, or paying for unneeded home repairs or products.
6. Problems with abstract thinking. When balancing a checkbook, they could forget completely what the numbers are and what needs to be done with them.
7. Misplacing things: Putting things in unusual places: an iron in the freezer or a wristwatch in the sugar bowl.

8. Changes in mood or behavior: Show rapid mood swings — from calm to tears to anger — for no apparent reason.
9. Changes in personality: Confusion, suspicion, fearfulness, or over-dependence on a family member.
10. Loss of initiative: May become very passive, sitting in front of the television for hours, sleeping more than usual, or not wanting to do usual activities.

If you recognize any warning signs in yourself or a loved one, the Alzheimer's Association recommends consulting a physician. Early diagnosis of Alzheimer's disease or other disorders causing dementia is an important step in getting appropriate treatment, care, and support services.

For more information please visit: www.alz.org