

# Study Suggests Low-dose Radiation May Reduce Lung Cancer Deaths

Dec. 8, 2010—The benefits of low-level radiation were hinted at in a recently completed National Cancer Institute (NCI) study of 53,000 heavy smokers with a high risk for lung cancer.

The NCI study, carried out at 33 major medical centers across the country, examined volunteers, aged 55 to 74, who had smoked the equivalent of at least a pack a day for 30 years. Starting in 2002, participants were randomly assigned to one of the two screening groups, CT or X-ray. Members of each group received three annual screenings and were then followed for at least five years. A CT scan (low-dose helical computer tomography) of the type employed in the study, provides 1.5 mSv (millisievert) of low-dose X-ray radiation, about double the radiation of a chest X-ray (0.8 mSv).

The study, intended to compare the screening capability of the two methods, now also suggests that mere exposure to the higher radiation dose of the CT scan may have contributed to a reduction in the numbers of deaths from lung cancer. Participants receiving the CT scan experienced 20 percent fewer deaths from lung cancer, after five years, as compared to those who received a conventional X-ray.

The group receiving the CT scans also experienced a 7-percent reduction in deaths from all causes, including lung cancer. It remains to be determined what portion of the health benefit may derive from the improved screening effect of the CT scan devices, and what from the known benefits of low-dose radiation.

## Lifesaving Results

There is no ambiguity about the lifesaving results, and for that reason, the NCI stopped the study early to announce the findings. There were 442 deaths from lung cancer among the trial group receiving the X-ray, compared to only 354 from the CT scan group.

Harold Varmus, director of the NCI, said: "Lung cancer is the leading cause of cancer mortality in the U.S. and through-



National Cancer Institute

*Videograb of a patient undergoing a CT scan. The video can be watched in full at [http://www.youtube.com/watch?v=azUn05s1dC4&feature=player\\_embedded#](http://www.youtube.com/watch?v=azUn05s1dC4&feature=player_embedded#)*

out the world, so a validated approach that can reduce lung cancer mortality by even 20 percent has the potential to spare very significant numbers of people from the ravages of this disease."

Denise Aberle, M.D., national principal study investigator, stated: "The results of this trial provide objective evidence of the benefits of low-dose helical CT screening in an older, high-risk population and suggest that if low-dose helical CT screening is implemented responsibly, and individuals with abnormalities are judiciously followed, we have the potential to save thousands of lives."

## Benefits of Low-Dose Radiation

The health benefits of low-level radiation have been known for more than 50 years, but specialists who have advocated its use have been stopped by the prevailing belief known as the Linear No-Threshold (LNT) theory. According to this theory, because high doses of radiation are harmful, lower doses are proportionally harmful. The unscientific argument is equivalent to saying that because you can drown in water, any amount of water is bad for you.

But thousands of scientific studies on human beings and animals have demonstrated that below a certain threshold, radiation is beneficial. Trials in Japan and in the United States, showed that exposure to full-body low-dose radiation before

targetted radiotherapy treatment for non-Hodgkin's lymphoma, can reduce the required amount of radiation and dramatically improve survival rates. Low-dose radiation therapy also prevented amputation and saved the lives of patients suffering from gas gangrene infections.

According to Dr. Myron Pollycove, Professor Emeritus of Laboratory Medicine and Radiology at the University of California at San Francisco, low-dose radiation helps to fight cancer and other disease by strengthening the immune system and by other means. The radiation stimulates cellular antioxidant prevention of DNA damage by free radicals, enzymatic repair of DNA damage, immunologic destruction of DNA damaged cells by killer T lymphocytes, and self-destruction (apoptosis) of DNA damaged cells.

The just-released study, suggesting that a reduction in lung cancer and overall death rates may be partially due to the exposure to low-dose radiation, opens the door to a serious revisiting of the proven benefits of low-level radiation. It is time to bury the unscientific Linear No-Threshold theory, and carry out both theoretical studies and medical testing to refine our knowledge of the lifesaving benefits of low-dose radiation.

The short-term benefits will include the saving of many millions of lives. In the longer term, an improved understanding of the interaction of life with radiation of all types will open the door to a deeper understanding of many still unsolved problems of fundamental science, and prove of practical importance in mankind's next great step forward, into the Solar System.

—The Editors,

*21st Century Science & Technology*

**For Further Reading**

Jim Muckerheide, "The Health Benefits of Low-Dose Irradiation" [www.21stcenturysciencetech.com/articles/nuclear.html](http://www.21stcenturysciencetech.com/articles/nuclear.html)

Jerry Cuttler, "Low-dose Irradiation Therapy Cures Gas Gangrene Infections" [www.21stcenturysciencetech.com/Articles/2007/20\\_1-2\\_Gangrene.pdf](http://www.21stcenturysciencetech.com/Articles/2007/20_1-2_Gangrene.pdf)