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Rosalyn S. Yalow, PhD

Radiation Risk and Nuclear Medicine: An Interview With a Nobel Prize Winner

In a speech given years ago at the Veterans Administration Medical Center, Bronx, NY, Roslyn S. Yalow, 1977 Nobel Prize recipient for her invention of radioimmunoassay made several salient points on the perception of fear or hazards from exposure to low-level radiation and low-level radioactive wastes. "So phobic is the fear that in the United States the new medical imaging modality, nuclear magnetic resonance or NMR has been renamed magnetic resonance or MR to avoid the bad word nuclear," Yalow said.

For the past three years, Yalow has been concerned with the general fear of radiation. Yalow insists that changing the name of nuclear medicine would help soften this world-wide fear of radiation risk. When invited to speak to communities about the concerns and issues of radiation risks, Yalow tries to emphasize how radiation use in medicine has benefited the medical field. In this interview, *Newsline* solicited Yalow's views on public perceptions on radiation risk and what the nuclear medicine community can do to emphasize the fact that, if properly managed, the use of isotopes in medicine and other cases is not dangerous.

Q: Why do you think radiation risk is such an important issue in nuclear medicine?

A: The general public is concerned with the amount of radiation exposure received in nuclear medicine procedures. What they do not realize is that the amount of radiation exposure from nuclear medicine is comparable to the doses received in diagnostic and therapeutic radiology.

Q: Do you think it was a mistake for the nuclear medicine community to "break away" from radiology?

A: Yes. In the 1950s when nuclear medicine became its own specialty, it hindered its acceptance and understanding by the public. Nuclear medicine is similar to radiology and people are not afraid of x-rays.

Q: What is the correlation between radon in the home and lung cancer?

A: Natural exposure to radiation resulted in little lung cancer; radon in homes has always existed. Before the 1930s, lung cancer was a rare disease— the number of lung cancer patients increased when people started smoking cigarettes.

Q: Has the impression of radiation risk changed over the years?

A: Yes. For the first ten years, when I began my study on radioisotopes, and through the founding of the Society of Nuclear Medicine in the 1950s, there was a general impression that radioisotopes had multiple clinical uses: Nuclear medicine has allowed physicians to understand human physiology better, which in turn, enhances the practice of medicine.

Q: How long did it take for the public to change its perception of nuclear medicine?

A: Research on the A-bomb de-emphasized the value of nuclear medicine until it reached the point where anything labeled "nuclear" was considered destructive. And that's the problem— making the correlation between nuclear medicine and bombs. It's not true. When the United States and Russia began building atomic weaponry, safety became a major concern.

Q: Do you think medical groups in general and, specifically the nuclear medicine community, have done a good job educating the public on radiation risks?

A: Unfortunately no, otherwise people would not be making the correlation between nuclear medicine and nuclear bombs. Since the damage has already been done, the medical community now needs to point out the similarities between nuclear medicine and radiology and stress that the day-to-day exposure of radiation is not harmful. It is interesting that people are more concerned about the radiation exposure received while undergoing nuclear medicine procedures than they are about x-ray therapy, when in fact, the doses are quite comparable.

Q: How has the media contributed to the public's fear of radiation over the years?

A: The media has created confusion by not getting the facts on both sides of the spectrum out to the public. My question is: Why are people afraid of nuclear medicine and not diagnostic radiology or radiotherapy?

Q: What is your general feeling on low-level waste sites? Do the people who live near a proposed waste site have a reason to be afraid?

A: I think we ought to start by asking the question, should people be afraid of flying because of the radiation exposure? I don't think people realize that flight crews are exposed to more radiation than plant [nuclear medicine] workers. It's important to point out that radiation exposure on aircrafts is generally more than you get from a radioactive waste disposal site.

Q: Comment on the linear, no-threshold hypothesis?

A: I don't believe in the no-threshold effect; below certain levels, there are no significant radiation effects. After all, we are not choosing to evacuate the Rocky Mountain states or cease flying in airplanes, even though we are definitely exposed to radiation in these situations.

Q: Do many of your colleagues reject the linear, no-threshold hypothesis?

A: Scientists have never, for the most part, accepted this hypothesis as a valid one.

Q: What are your views on hormesis— is a little radiation actually good for you?

A: Radiation is only good for you if you are receiving it for medical treatment. If you are exposed to radiation for a good reason— i.e., x-ray, diagnostic procedures with radioisotopes and/or treatment measures—then radiation is valuable.