PHYSICIANS' OBLIGATIONS IN RADIATION ISSUES

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Exposure to ionizing radiation continues to be of great public concern, fueled by reports from the media as depicted in Figure 1. The physician, confused by all these reports about the dangers of radiation whether from medical uses, fallout, or any other source, must ask, "What efforts have we made to educate ourselves and the public about nuclear accidents in order to minimize their health effects?" We hope the outcome will not be the situation depicted in Figure 2, where a physician leaves the area immediately after an accident to avoid being involved in something that is not understood.

UNDERSTANDING THE EFFECTS OF RADIATION

We have responsibilities as physicians to develop effective radiation programs that will (1) protect the public's physical and emotional health, (2) prevent and/or minimize illnesses and injury, and (3) treat and rehabilitate all exposed individuals.

To accomplish these goals, physicians should understand the basic elements of radiation physics, radiation biology, benefit/risk, radiation regulations, nuclear power production, and world energy needs.

A reasonably thorough discussion of any of these elements could easily occupy this entire conference. Fortunately, several have been addressed by previous speakers. The rudiments of radiation physics, crucial to any discussion of radiation matters, deserve a brief review.

The practice of medicine utilizes ionizing radiation from both radioactive materials and man-made sources. We must also realize that we are continually exposed to radiation from such natural sources as cosmic rays and radioactive components in building materials and soil. About 80% of our usual radiation exposure comes from natural sources and 20% from man-made sources, primarily medical radiation. Where we live or travel determines to some degree the amount of radiation that we will receive. For example, there is more radioactivity in a brick or stone house than in one containing wood (Figure 3). Because it is constructed of granite, New York's Grand Central Station has a background radiation level about twice that of the outdoors. One's background exposure is also dependent on altitude (Figure 4) and on relationship to the Van Allen belt; this high altitude band of protons and electrons controls the amount of cosmic rays that reach the earth. When we travel by air, we can expect to have a significant increase in radiation exposure.

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