New Studies Cite Medical Radiation Exposure

In 2006 (the latest year for which complete data are available), Americans were exposed to more than 7 times as much ionizing radiation from medical procedures as in the early 1980s, according to *Ionizing Radiation Exposure of the Population of the United States,* a report on population exposure released March 3 by the National Council on Radiation Protection and Measurements (NCRP) at its annual meeting in Bethesda, MD. In 2006, medical exposure constituted nearly half of the total radiation exposure of the U.S. population from all sources. "The increase was due mostly to the higher utilization of CT and nuclear medicine," said Kenneth R. Kase, PhD, senior vice president of NCRP and chair of the committee that produced the report. "These 2 imaging modalities alone contributed 36% of the total radiation exposure and 75% of the medical radiation exposure of the U.S. population." The numbers of CT scans and nuclear medicine procedures performed in the United States during 2006 were estimated to be 67 million and 18 million, respectively.

Only days before this report was issued, the journal *Radiology* published online ahead of print an article by Bingsheng Huang, MD, and colleagues from the University of Hong Kong on estimation of radiation dose and cancer risk from whole-body PET/CT scanning in U.S. and Hong Kong populations. The study appeared in print in the April issue of *Radiology* (2009;251:166–174). The authors assessed estimated radiation burden in 3 64-detector CT protocols with ^{18}F-FDG PET in a humanoid phantom equipped with thermoluminescent dosimeters. Effective doses were calculated according to International Commission on Radiological Protection standards, and lifetime attributable risks (LARs) of cancer incidence were estimated. They reported that effective doses with the various protocols ranged from 13.45 to 31.91 mSv for female patients and 13.65 to 32.18 mSv for male patients. For 20-y-old women in the United States, LARs of cancer incidence were between 0.231% and 0.514%, and for 20-y-old U.S. men, LARs of cancer incidence were between 0.163% and 0.323%. The authors concluded that "whole-body PET/CT scanning is accompanied by substantial radiation dose and cancer risk" and that "examinations should be clinically justified, and measures should be taken to reduce the dose."

Both this study and the NCRP report were picked up and reproduced with varying emphases by U.S. and international news media, already sensitized by regular reports in the medical literature on the radiation burden associated with CT imaging. On March 5, SNM issued a press release reaffirming the proven benefits of medical imaging. "Millions of Americans benefit each year from nuclear medicine procedures used to diagnose and treat a wide variety of diseases," said Robert W. Atcher, PhD, MBA, president of SNM. "The use of radiation in these procedures provides doctors with information that would otherwise require less accurate tests or exploratory surgery, necessitate more costly and invasive procedures, or simply be unavailable. The risks of *not* performing a needed medical exam are usually much greater than the risks of the radiation exposures associated with the exam."

National Council on Radiation Protection and Measurements
Radiology
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