

American College of Radiology White Paper on Radiation Dose in Medicine

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The benefits of diagnostic imaging are immense and have revolutionized the practice of medicine. The increased sophistication and clinical efficacy of imaging have resulted in its dramatic growth over the past quarter century. Although data derived from the atomic bomb survivors in Japan and other events suggest that the expanding use of imaging modalities using ionizing radiation may eventually result in an increased incidence of cancer in the exposed population, this problem can likely be minimized by preventing the inappropriate use of such imaging and by optimizing studies that are performed to obtain the best image quality with the lowest radiation dose. The ACR, which has been an advocate for radiation safety since its inception in 1924, convened the ACR Blue Ribbon Panel on Radiation Dose in Medicine to address these issues. This white paper details a proposed action plan for the college derived from the deliberations of that panel.

Key Words: Radiation dose, radiation safety, radiation risk, radiation exposure, radiations, exposure to patients and personnel

J Am Coll Radiol 2007;4:272-284. Copyright © 2007 American College of Radiology

INTRODUCTION

Ionizing radiation has been used for diagnostic purposes in medicine for more than a century. The benefits are immense and certainly exceed the risks. The more recent development of remarkable equipment such as multidetector row computed tomography and the increased utilization of x-ray and nuclear medicine imaging studies have improved the lives of our patients and, along with other new modalities, revolutionized the practice of medicine. However, this dramatic evo-

lution of imaging has also resulted in a significant increase in the population's cumulative exposure to ionizing radiation. Will this cause an increased incidence of cancer years down the line? Although the answer to that question is currently under debate, the presumption is that it will.

Consequently, there is increasing international and federal interest in, and scrutiny of, radiation dose from imaging procedures. Although there has been recent widespread interest in patient safety issues [1], the possible hazards associated with radiation exposure generally have not been brought into clear focus by the public or members of the medical community other than radiologists. The ACR, pursuing its commitment to radiation safety, currently supports the following activities: accreditation programs, practice guidelines and technical standards [2], Appropriateness Criteria[®] [3], a dose index registry (in progress), educational programs, the RadiologyInfo public information Web site (jointly developed with the Radiological Society of North America [RSNA]) [4], collaborations with government and legislators on safety issues, and research activities such as the ACR Imaging Network (ACRIN)[®]. To further enhance radiology's leadership role in the arena of patient safety, the chairman of the ACR Board of Chancellors convened the ACR Blue

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