Immediate Release

NCRP Report No. 170, *Second Primary Cancers and Cardiovascular Disease After Radiation Therapy*

Advances in cancer therapy, early detection of cancer, and supportive care have contributed to steady gains in the five year relative survival rate for all cancers considered together, reaching 66.1 % between 1999 to 2006. These successes are associated with a tripling of the number of cancer survivors in the United States since 1971, and the numbers are growing by 2 % each year. As of 2007, there were ~12 million men and women in the United States with a history of cancer, representing 3.5 % of the population. Radiation remains a cornerstone of successful cancer treatment, with 50 % of all patients estimated to have received radiation therapy for the management of their cancer. For many patients, the gains in survival have come at the price of serious treatment-associated late effects.

Second primary cancers (SPCs) and cardiovascular disease (CVD) are two of the most frequent and important life-threatening events associated with radiation therapy. Multiple primary cancers now account for approximately one in six of all incident cancers reported each year to the National Cancer Institute Surveillance, Epidemiology and End Results Program. NCRP Report No. 170, *Second Primary Cancers and Cardiovascular Disease After Radiation Therapy*, provides a comprehensive and current assessment of the risk of SPC and CVD following radiation therapy among the growing number of cancer survivors worldwide. The Report focuses on the complex epidemiologic and dosimetry issues surrounding past, conventional, and the new radiation therapy modalities and techniques, including intensity-modulated radiation therapy and proton-beam therapy.

Major epidemiologic studies are reviewed that have provided estimates of the risk of SPC and CVD following exposure to therapeutic doses of radiation in children, adolescents, and adults. Special attention is given to those cancer sites for which dose-response relationships between radiation dose and SPC or CVD have been provided. There is a wealth of knowledge on the risk of SPC following radiation therapy indicating clear increases following high-dose and scatter-dose radiation. For example, radiation-specific increases in the risk of second cancers have been reported for breast, lung, thyroid, brain, bone, soft tissue, and leukemia. Quantitative estimates of risk for CVD are just now emerging and are an important area of future research. Past and current approaches to estimate individual specific doses to organs outside the primary treatment fields from various radiation modalities are summarized in this Report.

The target audience for this Report is broad, including oncologists, clinicians, epidemiologists, patients, medical physicists, health physicists, dosimetrists, pediatricians, cardiologists, health-care professionals, and government personnel involved with radiation and cancer treatment issues. The Report ends with a summary of recommended research initiatives that could be undertaken to advance knowledge on the risk of developing SPC or CVD following radiation therapy in the treatment of a first primary cancer.

The Report is available from the NCRP website, http://NCRPpublications.org, in both soft- and hardcopy formats. For additional information contact David A. Schauer, ScD, CHP at schauer@NCRPonline.org, 301.657.2652 (x20) or 301.907.8768 (fax).

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