

RISK FACTORS FOR SECOND PRIMARY NEOPLASMS (SPNs) IN LONG-TERM SURVIVORS OF CHILDHOOD CANCER—INITIAL ANALYSIS OF THE CHILDHOOD CANCER SURVIVOR STUDY (CCSS)

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Objective: To determine the incidence of, and risk factors for, SPNs in long-term survivors of childhood cancer.

Methods: A retrospective cohort of 5+ year survivors of childhood cancer diagnosed between 1970 and 1986, under age 21, were identified at 25 institutions. Standardized incidence ratios (SIR) were calculated using age-, race-, and sex-specific U.S. incidence rates (SEER Program, NCI). Therapeutic exposures were abstracted from each medical record. Chemotherapy exposures including alkylating agent scores and cumulative platinum exposures were calculated as previously described.

Results: 408 SPNs were identified among 13,462 survivors. These included 65 non-melanoma skin cancers that are excluded from this analysis. Thirty-one meningiomas were reported as were 35 *in-situ* or other benign neoplasms. A 4.8-fold excess (95% C.I.: 4.3-5.4) of invasive cancers occurred during follow-up. At 20 years, the incidence of SPN was 4.0% (95% C.I.: 3.5-4.5). The most common SPNs were of the CNS (n=39, excluding meningiomas; SIR=7.7), breast (n=52; SIR=15.4), thyroid (n=41; SIR=10.3), and bone (n=30; SIR=16.0). The absolute risk of SPN was 1.10 excess cases per 1,000 patient years. A greater risk was evident among females (SIR=6.0) than males (SIR=3.6). Univariate analysis of radiation and chemotherapy exposure did demonstrate associations between radiation, cumulative alkylating agent exposure, platinum exposure and epipodophyllotoxin exposure with overall SPN risk as well as risk of specific SPNs. Analyses are currently being conducted to evaluate independent treatment-related risks as well as potential interactions between treatment, disease and host factors.

Conclusions: Survivors of childhood cancer are at an increased risk of SPN which is influenced by both host and treatment characteristics. However, the number affected in the first two decades following initial cancer diagnosis is modest in contrast to the remarkable impact these therapies have had on ultimate survival.