RISK OF SECOND PRIMARY NEOPLASMS (SPNs) IN SURVIVORS OF CHILDHOOD CANCER—INITIAL ANALYSIS OF THE CHILDHOOD CANCER SURVIVOR STUDY (CCSS)

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The CCSS is a multi-institutional retrospective cohort study of long-term survivors of childhood cancer. Incident cases between 1970 and 1986 under age 21 who survived 5+ years were identified at 25 institutions. Among 13,254 survivors (median age 26 years) included in the first data analysis, 409 SPNs were identified. In 65 cases, these were solely basal (n=62) or squamous cell (n=3) carcinomas of the skin and are excluded from the analyses below. Thirty-one benign meningiomas were reported as were 35 *in-situ* or other benign neoplasms. Two hundred and seventy-eight invasive cancers were pathologically confirmed. The standardized incidence ratios (SIR) (invasive cancers only), 95% Confidence Intervals (CI) and cumulative incidence of SPN (including meningioma and *in-situ* cancer) is shown below:

	Risk of SPN	Cumulative Incidence (95% C.I.)	
Original Dx	*SIR (95% C.I.)*	*15 years post dx*	*20 years post dx*
All Cancers	4.9 (4.4-5.5)	2.3% (2.0-2.6)	4.0% (3.5-4.5)
Leukemia	4.5 (3.4-5.7)	1.6% (1.2-2.1)	3.1% (2.2-3.9)
CNS Tumors	2.4 (1.4-3.9)	2.1% (1.3-2.9)	3.3% (2.0-4.6)
Lymphoma	3.5 (2.0-5.6)	3.5% (2.7-4.2)	6.4% (5.1-7.7)

The most common SPNs were of the CNS, breast, thyroid, and bone. The absolute risk of SPN was 1.10 excess cases per 1,000 patient years. A greater risk was evident among females (SIR = 6.2, 95% CI, 5.3-7.2) than males (SIR = 3.7, 95% CI, 3.1-4.5). Cumulative incidence of specific invasive SPNs was:

	Risk of SPN	Cumulative Incidence (95% C.I.)	
SPN	*SIR (95% C.I.)*	*15 years post dx*	*20 years post dx*
CNS Tumors	7.7 (5.5-10.6)	0.5% (0.4-0.6)	0.8% (0.6-1.0)
Bone	16.0 (10.8-22.9)	0.2% (0.1-0.3)	0.3% (0.2-0.4)
Breast (females)	15.4 (11.5-20.2)	0.6% (0.3-0.8)	1.5% (1.0-2.0)
Thyroid	10.3 (7.4-13.9)	0.2% (0.1-0.3))	0.5% (0.3-0.7)

Patients diagnosed in the earliest years of the cohort appeared to be at the same risk as children diagnosed in later years. While survivors of childhood cancer are at an increased risk of SPN, the number affected in the first two decades is relatively modest in contrast to the remarkable gains in survival. Analysis of these data according to treatment-specific groups, to identify high-risk populations, will form the foundation for screening and intervention strategies.