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Title: Psychological and Educational Outcomes among Adolescent Survivors of Wilms Tumor: A Report from the Childhood Cancer Survivor Study

Background: Little is known about psychological and educational problems experienced by adolescent survivors of Wilms tumor (WT), including the impact of treatment exposures and chronic health conditions.

Methods: Parent-reports from the Childhood Cancer Survivor Study were analyzed for 666 adolescent survivors of WT (Mean[SD] age at survey = 15.3[1.65] years; age at diagnosis = 2.8[1.77] years) and 698 siblings (15.4[1.66] years). Adjusting for race and household income, survivors were compared to siblings on the Behavior Problem Inventory and educational services. Among survivors, therapeutic exposures and chronic medical conditions (CTCAE 4.03 coding) were examined via multivariable log binomial regression adjusting for sex, race, income and age at diagnosis to calculate adjusted Relative Risk (aRR) and 95% confidence intervals (CI).

Results: Compared to siblings, survivors were more likely to use psychoactive medication (9.4 vs. 5.1%, $p = .0002$) or be in special education for learning problems, inattention, and/or low test scores (19.1 vs. 11.1%, $p = .003$) but had similar rates of depression/anxiety, headstrong behavior, inattention, social withdrawal, and antisocial behavior (p 's $> .05$). Survivors who received radiation therapy (RT) to the abdomen (aRR 1.64, CI 1.03-2.61) or abdomen and chest (aRR 1.95, CI 1.16-3.26) were more likely to be in special education for any reason than those without RT. Those with grade 2-4 cardiovascular conditions were more likely to have anxiety/depression (aRR 2.04, CI 1.26-3.30), headstrong behavior (aRR 1.95, CI 1.30-2.93), or inattention (aRR 1.58, CI 1.04-2.42) compared to survivors with grade 0/1 conditions. Survivors were more likely to be in special education if they had problems with antisocial behavior, anxiety/depression, headstrong behavior, inattention or social withdrawal (p 's $< .05$).

Conclusions: Psychological intervention may be needed for adolescent survivors of WT treated with RT to the abdomen or abdomen and chest or with higher grade cardiovascular conditions. These survivors are more likely to experience behavioral and emotional problems, which in turn increases risk for placement in special education.