

Executive Functioning in Long-Term Survivors of Childhood Brain Tumors

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Purpose: To assess executive functioning in long term survivors of childhood brain tumors.

Participants & Methods: As part of the Childhood Cancer Survivor Study (CCSS), 881 survivors of childhood Central Nervous System (CNS) cancers, 6265 survivors of other childhood cancers, 393 siblings and 909 controls completed a 15 item version of the Behavior Rating Inventory of Executive Function--Adult version (BRIEF-A), whose Scale and Index scores correlated well with those of the larger BRIEF-A.

Results: Survivors of CNS tumors showed substantially increased BRIEF Index and Scale scores compared to other cancer survivors, siblings and the normative group ($p < .001$). Within the CNS tumor group, multiple linear regression indicated that cranial radiation therapy predicted higher BRIEF Total, Metacognitive Index and Working Memory Scale scores ($p < .001$), the placement of a ventriculoperitoneal shunt at any time as well as ongoing sensory and motor complications predicted higher scores on all BRIEF measures ($p = .033$ to $p < .001$) and female gender specifically predicted higher scores on the Emotional Control Scale ($p < .001$). In CNS tumor survivors, higher BRIEF scores predicted lower educational attainment, income and level of satisfaction on the SF-36, a Quality of Life questionnaire.

Conclusions: Survivors of childhood CNS tumors are at significant risk for impairment in executive functioning in adulthood, particularly if they have received cranial radiation, had a VP shunt placed or are left with impairments in sensory and/or motor functions. These deficits impact substantially on attainment of adult academic and occupational goals as well as life satisfaction.