Neurologic Predictor Scale (NPS). Socio-demographic factors examined included sex, race, insurance type, parental education, and Area Deprivation Index (ADI) as a measure of neighborhood deprivation/access to community resources. One sample t-tests compared the brain tumor sample to population normative means. Correlations examined associations between practical skills and medical and socio-demographic variables. To determine predictors of practical skills, significant correlations were entered into separate linear regressions for each of the four practical subscales (Community Use, Home Living, Health & Safety, Self-Care).
Results: Participants were diagnosed around 7 years and were approximately 5 years from diagnosis at the time of neuropsychological evaluation. Practical skills were clinically and statistically significantly below the normative mean (Standard Score=85.5, p<.001). Additionally, all practical subscales were statistically significantly below the normative mean (p<.001), with both Community Use (Scale Score=7.6, p<.001) and Home Living (Scaled Score=6.9, p<.001) being clinically significant. Community Use was positively correlated with age at diagnosis (r=.27, p=.004) and negatively correlated with Neurologic Predictor Scale (r=-.33, p<.001), time since diagnosis (r=-.24, p=.01), and ADI (r=-.23, p=.02). Health and Safety was positively correlated with age at diagnosis (r=.21, p=.024). Self-Care was positively correlated with age at diagnosis (r=.202, p=.029) and parental education (r=.203, p=.037); Home Living was not correlated with any of the variables examined. Predictors of Community Use included NPS score (p=.002); ADI approached significance (p=.07). Age at diagnosis predicted Health & Safety practical skills (p=.024), and parental education predicted Self-Care skills (p=.004).
Conclusions: Pediatric brain tumor survivors demonstrate clinically significant weakness in practical skills. While specific medical and socio-demographic factors contribute to lower practical adaptive functioning (e.g., younger age at diagnosis, higher NPS score suggestive of greater treatment burden, longer time since diagnosis, lower ADI score suggestive of greater neighborhood deprivation, and lower parental education), medical and socio-demographic factors do not equally impact practical adaptive functions, but rather individual factors predict specific practical skills. While there is appreciation for the contribution of medical factors in pediatric oncology, few studies have examined socio-demographic factors in this population. This study highlights the importance of considering the role of family and environmental factors on neuropsychological functioning in pediatric oncology in addition to medical factors.

Categories: Cancer
Keyword 1: adaptive functioning
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Keyword 3: pediatric neuropsychology
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16 Superior Verbal Learning and Memory in Pediatric Brain Tumor Survivors Treated with Proton Versus Photon Radiotherapy

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Objective: Radiotherapy for pediatric brain tumor has been associated with late cognitive effects. Compared to conventional photon radiotherapy (XRT), proton radiotherapy (PRT) delivers less radiation to healthy brain tissue. PRT has been associated with improved long-

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term cognitive outcomes compared to XRT. However, there is limited research comparing the effects of XRT and PRT on verbal memory outcomes.
Participants and Methods: Survivors of pediatric brain tumor treated with either XRT (n = 29) or PRT (n = 51) completed neuropsychological testing > 1 year following radiotherapy. XRT and PRT groups were similar with respect to sex, handedness, race, age at diagnosis, age at evaluation, tumor characteristics, and treatment history (i.e., craniospinal irradiation, craniotomy, shunting, chemotherapy, radiation dose). Verbal learning and memory were assessed using the age-appropriate version of the California Verbal Learning Test (CVLT-II/CVLT-C). Measures of intellectual functioning, executive functioning, attention and adaptive behavior were also collected. Performance on neuropsychological measures was compared between treatment groups (XRT vs. PRT) using analysis of covariance (ANCOVA). On the CVLT, each participant was classified as having an encoding deficit profile (i.e., impaired learning, recall, and recognition), retrieval deficit profile (i.e., impaired recall but intact recognition), intact profile, or other profile. Chi-squared tests of independence were used to compare the probability of each memory profile between treatment groups. Pearson correlation was used to examine associations between memory performance and strategy use, intellectual functioning, adaptive behavior, attention, and executive functioning.
Results: Overall, patients receiving PRT demonstrated superior verbal learning (CVLT Trials 1-5; $t(76) = 2.61$, $p = .011$) , recall (CVLT Long Delay Free; $t(76) = 3.57$, $p = .001$) and strategy use (CVLT Semantic Clustering; $t(76) = 2.29$, $p = .025$) compared to those treated with XRT. Intact performance was more likely in the PRT group than the XRT group (71% PRT, 38% XRT; $X2 = 8.14$, $p = .004$). Encoding and retrieval deficits were both more common in the XRT group, with encoding problems being most prevalent (Encoding Deficits: 31% XRT, 12% PRT, $X2 = 4.51$, $p = .034$; Retrieval Deficits: 17% XRT, 4% PRT, $X2 = 4.11$, $p = .043$). Across all participants, semantic clustering predicted better encoding ($r = .28$, $p = .011$) and retrieval ($r = .26$, $p = .022$). Better encoding predicted higher intellectual ($r = .56$, $p < .001$) and adaptive functioning ($r = .30$, $p = .011$), and fewer parent-reported concerns about day-to-day attention ($r = -.36$, $p = .002$), and cognitive regulation ($r = -.35$, $p = .002$).
Conclusions: Results suggest that PRT is associated with superior verbal memory outcomes compared to XRT, which may be driven by encoding skills and use of learning strategies. Moreover, encoding ability predicted general intellectual ability and day-to-day functioning. Future work may help to clarify underlying neural mechanisms associated with verbal memory decline following radiotherapy, which will better inform treatment approaches for survivors of pediatric brain tumor.

Categories: Cancer
Keyword 1: brain tumor
Keyword 2: radiotherapy
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17 Comparing Cognitive Patient-Reported Outcomes with Neuropsychological Impairment in Patients with Diffuse Glioma.

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Objective: Cognitive difficulties among diffuse glioma survivors are common in survivorship due to cancer treatment effects (i.e., surgery,

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