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
Keyword 3: pediatric neuropsychology
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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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chemotherapy, and/or radiation therapy), which can diminish quality of life. Routine monitoring of cognitive symptoms in survivorship is recommended and can help address patient needs and inform clinical interventions (e.g., cognitive rehabilitation). While several patient-reported outcome (PRO) measures have been used in brain tumor populations, there has been few studies comparing the performance of these PROs in patients with diffuse glioma. In order to better understand the value of different PROs, we conducted preliminary analyses associating cognitive PROs with neuropsychological impairment in a well-characterized sample of patients with diffuse glioma.
Participants and Methods: 23 glioma patients (mean aged 44.26 ± 12.24), six or more months after completing cancer treatment, underwent comprehensive psychosocial and neuropsychological assessments. The neuropsychological battery included the Hopkins Verbal Learning Test – Revised, Brief Visuospatial Memory Test – Revised, Wechsler Adult Intelligence Scale-IV tests of Coding and Digit Span, Trail-Making Test, Stroop Test, FAS, Animals, Boston Naming Test, and Rey-Osterrieth Complex Figure (copy). Completed cognitive PROs included the Functional Assessment of Cancer - Cognitive Function and Brain questionnaires (FACT-Cog; FACT-Br), the European Organization for the Research and Treatment of Cancer Quality of Life Questionnaire for Brain Neoplasms (EORTC QLQ-BN20), and the Multidimensional Fatigue Symptom Inventory, short form (MFSI-SF) Mental subscale. Based on published norms, we divided the sample into cognitively impaired and non-impaired groups (two or more primary neuropsychological test scores <= -2 z-score). We compared PRO scores between impaired and non-impaired groups using Mann-Whitney U tests. Higher medians equate to better cognitive functioning for all PROs, except for the MSFI-SF.
Results: We found significantly worse scores in the impaired group compared to non-impaired group on the FACT-Cog subscales of perceived cognitive ability (PCA), [Non-Impaired (Mdn = 21, n = 11), Impaired (Mdn = 10, n = 12), U = 22.5, z = -2.68, = 0.007], perceived cognitive impairment (PCI), [Non-Impaired (Mdn = 59, n = 11), Impaired (Mdn = 44, n = 12), U = 32.5, z = -2.06, p=0.039]. The impaired group also trended towards worse scores on the FACT-Br additional concerns subscale [Non-Impaired (Mdn = 79.5, n = 10), Impaired (Mdn = 61, n = 12), U = 32.5 , z = -1.81, p=0.07]. Group differences were not observed on the MSFI-SF [Non-Impaired (Mdn = 5, n = 11), Impaired (Mdn = 7, n = 12), U = 40.5, z = -1.57, p=0.12], or EORTC Cognitive Functioning subscale [Non-Impaired (Mdn = 83.33, n = 10), Impaired (Mdn = 75, n = 12), U = 42, z = -1.23, p=0.218].
Conclusions: The preliminary findings suggest that the FACT-Cog, especially the PCA and PCI correspond with neuropsychological impairment among diffuse glioma survivors better than other cognitive PROs. The FACT-Br subscale was somewhat effective. The MFSI-SF Mental and EORTC Cognitive Functioning subscales did not correspond to impairment status. The FACT-Cog is a promising instrument and future work is needed to better determine relative utility of cognitive PROs in this population.

Categories: Cancer
Keyword 1: brain tumor
Keyword 2: neuro-oncology
Keyword 3: cognitive functioning
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18 Executive Dysfunction Following Treatment for Pediatric Low Grade Brain Tumors: Increased Risk Associated with Infratentorial Tumor Location

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Objective: Treatment for pediatric brain tumors (PBTs) is associated with neurocognitive risk, including declines in IQ, executive function, and visual motor processing. Low grade tumors

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