influence of family, educational, and hospital supports, and identify areas of unmet need. PARTICIPANTS AND METHODS: PBTS (N=56, M age=11 8.12, range=10–25) completed questionnaires on academic accommoda-
tions. Medical chart reviews provided diagnostic and treatment data. A subset of families, who did not significantly differ from the larger sample on demographics, completed qualitative interviews (N=25). Three coders identified themes separately for parents and survivors and reached consensus (kappa’s > .78) using thematic content analysis. RESULTS: Familial factors sized the role of family support, including providing individualized help, setting up a structured learning environment, and suggesting metacognitive strategies. Parents also emphasized how they have adjusted their expectations. At school, 53% reported an individualized education plan. Formal accommodations (e.g., modified coursework, small group instruction, extra time) were helpful, yet some noted barriers, including embarrassment and lack of follow-through. Survivors emphasized the value of informal accommodations. Families described unmet needs related to connecting with other survivors, navigating community and educational resources, and transition to adulthood. CONCLUSIONS: PBTS seem to rely on systems-level supports to mitigate neurocognitive effects. Future work should strengthen communication between systems and adult transition services.

QOL-07. CORTICAL VOLUME AND THICKNESS IN ADULT SURVIVORS OF CHILDHOOD POSTERIOR FOSSA TUMORS

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PURPOSE: A brain tumor treatment including cranial radiotherapy has previously been associated with long-term neurocognitive sequelae. Since underlying neurological mechanisms remain inconclusive, we investigated cortical features in childhood posterior fossa tumor survivors. METHODS: T1-weighted MRI (MPRAGE, resolution=98x98x1.2mm) was acquired to investigate the cortical structure in adult survivors of childhood infratentorial tumors (n=19, 15 males; 16.4–34.8 years old, 2-years after treatment). These scans were compared to age- and gender-matched controls. Supratentorial cortical volume and thickness were investigated using voxel-based morphometry (VBM) and surface-based morphometry (SBM), respectively. We compared patients and controls, irradiated (n=13) versus non-irradiated patients, and investigated the age at radiotherapy (peak level: p<0.001). RESULTS: Lower GM volumes were encountered in multiple brain areas of patients compared to controls, in the right and left occipital lobe. Non-irradiated patients showed lower GM volumes then non-irradiated patients in the superior and middle frontal gyrus, the right supramarginal gyrus and precuneus. Age at radiotherapy was associated with GM volume in the inferior frontal gyrus. SBM yielded larger cortical thickness in patients in the left precuneus, inferior temporal and fusiform gyrus. The opposite effect was only marginally significant, in the left temporal lingual gyrus. Age at radiotherapy was not associated with cortical thickness, but radiotherapy was associated with the presence of the left parietal lobe GM reductions. CONCLUSION: Widespread differences in cortical volumes and thickness were observed in posterior fossa tumor survivors. Both radiotherapy and age at radiotherapy could be suggested as risk factors for long-term cortical development.

QOL-09. WHOLE-BRAIN WHITE MATTER NETWORK CONNECTIVITY IS DISRUPTED BY PEDIATRIC BRAIN TUMOR TREATMENT

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INTRODUCTION: Treatments for pediatric brain tumors (PBT) are neurotoxic and lead to long-term deficits that are driven by the perturbation of underlying white matter (WM). It is unclear if and how treatment may impact connectivity across the whole brain, and return WM to a normal state. METHODS: Magnetic resonance images from 41 PBT survivors (mean age: 13.19 years, 53% M) and 41 typically developing (TD) children (mean age: 13.32 years, 51% M) were analyzed. Image reconstruction, segmentation, and node parcellation were completed in FreeSurfer. DTI maps and probabilistic streamline generation were completed in MRtrix3. Connectivity matrices were based on the number of streamlines connecting two nodes and the mean DTI (FA) index across streamlines. We used graph theoretical analyses to define structural differences between groups, and random forest (RF) analyses to identify WM hubs that reliably classify PBT and TD children. RESULTS: For survivors treated with radiation, betweenness centrality was greater in the left insular (p<0.000) but smaller in the right pallidum (p<0.05). For survivors treated without radiation (surgery-only), betweenness centrality was smaller in the right interparietal sulcus (p<0.05). RF analyses showed that differences in WM connectivity from the right pallidum to other parts of the brain reliably classified PBT survivors from TD children (classification accuracy = 77%). CONCLUSION: The left insular, right pallidum, and right inter-parietal sulcus are structurally perturbed hubs in PBT survivors. WM connectivity from the right pallidum is vulnerable to the long-term effects of treatment for PBT.

QOL-11. COMPARISON OF TREATMENT BURDEN RATING SCALES ON NEUROCOGNITIVE OUTCOMES IN A MIXED SAMPLE OF PEDIATRIC BRAIN TUMOR SURVIVORS

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BACKGROUND: Predicting neurocognitive outcomes in pediatric brain tumor (PBT) patients is challenging. Rarity of PBT makes inclusion of detailed risk factors (e.g., treatment modality, intensity, individual complications) difficult when sample sizes are small. The Neurological Predictor Scale (NPS) summarizes complications and treatment factors associated
with neurocognitive risks and has modest validation. Recently, the Pediatric Neuro-Oncology Rating of Treatment Intensity (PNORTI) was developed to evaluate the impact of treatment intensity on psychosocial outcomes but has not been correlated to neurocognitive outcomes. This study compared the NPS and PNORTI in terms of relationship to neurocognitive outcomes known to be at risk in PBT survivors. METHODS: 88 PBT survivors' neuropsychological outcomes were retrospectively analyzed in relation to the NPS and PNORTI. Variables of interest included IQ, working memory, and processing speed. RESULTS: NPS associated with lower IQ (r=-.476, p<.001), lower working memory (r=-.323, p=.010), and lower processing speed (r=-.389, p=.007) in patients diagnosed at a younger age, but only processing speed for children diagnosed after age 7 years (r=-.262, p=.036). PNORTI was not correlated with neurocognitive variables for either group. CONCLUSION: NPS has value in predicting neurocognitive outcomes, though much more in a younger age at diagnosis group compared to older patients. The PNORTI did not demonstrate predictive value for these neurocognitive domains in our sample. Given the potential clinical and research value of a summary rating of treatment burden relating to long-term outcome, future research should include relationship to psychosocial outcomes and quality of life.

QOL-12. CLINICAL SIGNIFICANCE OF RADIATION-INDUCED CEREBROVASCULAR DISEASE IN CHILDHOOD BRAIN TUMOR SURVIVORS

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OBJECTIVES: Reduced neurocognitive outcomes are major concern in pediatric patients with malignant brain tumors. We aimed to estimate the decline in cognitive function according to treatment regimens. METHODS: Cross-sectional analysis of cognitive functions tested with the Neuropsychological Basic Diagnostic tool (NBD) in 279 patients >4 years at diagnosis (mean: 8.66; range: 4.01–18.98) with medulloblastoma (n=110, 23.7–25.0Gy CSI; n=131, 20Gy CSI) or posterior fossa ependymoma (n=38 local radiotherapy) who participated in the HIT-2000 trial. Multivariable regression analysis was conducted to adjust for postoperative cerebellar mutism syndrome, preoperative hydrocephalus, postoperative shunt placement, tumor diagnosis and assessment, sex and age. RESULTS: Mean time from diagnosis to assessment was 5.1 years. Increasing CSI-dose was significantly associated with a deterioration in performance of most subtests, particularly in areas of fluid intelligence (mean z-scores per test: CSI=23.4Gy/CSI=30Gy respectively: matrix reasoning: 0.40/0.52; 0.98, p<.001), short-term memory (number recall: -0.07/-0.58/0.64, p=.002), visuo-spatial skills (visual-motor integration: -0.49/-0.68/-1.12, p=.001) and motor skills (dominant-hand:-1.09/-1.80/-2.12, p=.006; non-dominant-hand:-1.47/-2.59/-2.82, p=.003); bimanual coordination: -1.33/-2.68/-2.76, p=.001. These differences were retained after adjustment for confounding variables. Within medulloblastoma patients treated with >30Gy CSI, selective attention, but no other function was reduced in patients treated with pre-radiotherapy chemotherapy including intraventricular MTX (selective attention (with chemotherapy/without chemotherapy mean z-values: -0.660/0.00, p=.006)). Patients with SHH-related medulloblastoma was significantly better than WNT group at high-dose chemotherapy. Group 84 medulloblastoma patients in fluid intelligence and fine motor skills. CONCLUSION: CSI dose among other highly relevant factors had significant effects on neurocognitive outcome. Pre-radiotherapy intraventricular MTX had only minor effects. Patients with SHH-inactivated medulloblastomas showed a more favorable outcome when compared to patients in the other subgroups.

QOL-14. A BIOPSYCHOSOCIAL APPROACH TO BRAIN INJURY REHABILITATION FOLLOWING TREATMENT FOR PAEDIATRIC BRAIN TUMOURS: CAN PHARMACOTHERAPY AID NEUROPSYCHOLOGICAL OUTCOMES?

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Long term survival following paediatric brain tumours has vastly improved in recent decades. Consequently there is a drive towards improving quality of survivorship. Brain tumours, surgical resection and adjuvant therapies represent mechanisms for brain injury and can therefore negatively impact a child's neuropsychological trajectory; affecting cognition, behaviour, emotional and adaptive functioning and educational/occupational outcomes. A biopsychosocial approach to rehabilitation should target each of these domains through supported remediation, environmental modification and psychosocial support for young people and the key systems around them (e.g. families, education). There is a growing evidence base for the role of concordant psychopharmacology to improve neurological outcomes. Since 2015 children treated at RHSC Edinburgh for brain tumours have been offered pharmacotherapy alongside usual rehabilitation approaches if they demonstrate significant difficulties with Attention, Processing Speed and/or Executive Function on formal neuropsychological assessment. Patients are referred to a Consultant Psychiatrist or Paediatrician (as per local protocol) for medication selection, titration and monitoring. A short case series (N=14) is presented outlining brain tumour pathophysiological modalities, neuropsychological profile and rationale for recommending pharmacotherapy. Approximately 50% of patients took up the offer. The treatment/s offered and self or parents reported outcomes is summarised. Pharmacotherapy; it’s been less than a ‘silver bullet’, although for one case (N=1) the side effects outweighed any benefit; “she became even more emotional”. Findings indicate that pharmacotherapy should be considered alongside conventional neurorehabilitation techniques for CYP with specific cognitive difficulties following treatment for paediatric brain tumours.