ation (CSI) of either 23.4Gy (standard dose; SDCSI) or 18Gy (lower dose; LDCSI). Children aged 8+ received SDCSI. All children were also randomized to receive either a reduced radiation boost to the involved field (IFRT) or a standard boost to the whole posterior fossa (PFRT). Memory functioning was evaluated an average of 0.67(T1), 2.95(T2), and 4.90(T3) years post-diagnosis. RESULTS: Of 464 eligible patients enrolled on ACNS0331, 354 (76%; 65.3% male, 83.1% white) completed some neuropsychological testing. Mean age at diagnosis was 9.1 years (range=3–19). Verbal and visual short-term memory and learning were broadly within the average range for the overall sample at all three timepoints. However, a large percentage of children exhibited scores ≥1SD below the mean on tasks of verbal learning both immediately (43.4%) and after a delay (40.7%) at T3. In addition, 58.6% of children randomized to SDCSI exhibited impairment in verbal learning after a delay compared to 34.8% of children randomized to LDSCI, and 35.0% of those aged ≥8 at diagnosis receiving SDCSI. CONCLUSIONS: Younger children receiving SDCSI have particularly high rates of memory impairment five years after diagnosis of medulloblastoma. Limiting CSI dose and/or volume in young children treated for this diagnosis may improve outcomes for memory functioning.

QOL-21. DEVELOPMENT AND UTILISATION OF A NEURO-ONCOLOGY REHABILITATION TEAM: 2018–2019 UPDATE

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INTRODUCTION: A multi-disciplinary Neuro-Oncology Rehabilitation Team (NORT) was established at our institution in 2014. We reviewed NORT inputs, processes and outputs in 2018 to 2019 compared to our previously presented data from 2015, soon after service inception. METHODS: Retrospective analysis of patients who received NORT input June 2018 - May 2019 compared to 2015 data. Descriptive analysis of changes to NORT operational processes and structure. Complexity of rehabilitation needs was measured using the Rehabilitation Complexity Scale-Extended V13 (RCS). RESULTS: 54 children received NORT input in 2018–2019 (10 children in 2015) with total of 129 outputs. NORT input was highest in children with high grade glioma (median reviews: 3; median RCS: 5) and ependymoma (median reviews: 3; median RCS: 5). Pilocytic astrocytoma formed the largest tumour group (n = 11; median reviews: 2; median RCS: 7). 11% patients were referred to neurologist (9% already known); 17% referred to community services (44% already known); 31% referred to neuropsychology. In 2015, outputs were predominantly referral to occupational therapy and physiotherapy. 6 patients (11% of 54) were discharged in 2018–2019 (40% of 10 patients in 2015). 4 patients died. Between 2015 and 2019, developments included: clarifying referral and discharge pathways, use of screening measures, neuropsychology integration, therapy-led drop-in clinics, use of RCS-E. DISCUSSION: There has been a clear increase in utilisation and scope of work of NORT over last 4 years. The strength of this team is multidisciplinary working and expertise. Further developments planned: multidisciplinary rehabilitation interventions and NORT outcome tools.

QOL-22. MACHINE-LEARNING INFERENCE MAY PREDICT QUALITY OF LIFE SUBGROUPS OF ADAMANTINOMATOUS CRANIOPHARYNGIOMA

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BACKGROUND: Due to disease and/or treatment-related injury, such as hypothalamic, visual, and endocrine damage, quality of life (QoL) scores after childhood-onset Adamantinomatous Craniopharyngioma (ACP) are among the lowest of all pediatric brain tumors. Decision-making regarding management would be aided by more complete understanding of a patients likely QoL trajectory following intervention. METHODS We retrospectively analyzed caregiver and patient-reported QoL-instruments from the first 50 patients (ages 1–17 years at diagnosis) enrolled in the international Advancing Treatment for Pediatric Craniopharyngioma (ATPC) consortium. Surveys included 205 pediatric-relevant questions and were completed at diagnosis, and 1- and 12-months following diagnosis. Using Multiple Correspondence Analysis (MCA), these categorical QoL surveys were interrogated to identify time-dependent patient subgroups. Additionally, custom deep learning classifiers were developed using Google's TensorFlow framework. RESULTS By representing QoL data in the reduced dimensionality of MCA-space, we identified QoL subgroups that either improved or declined over time. We assessed differential trends in QoL responses to identify variables that were subgroup specific (Kolmogorov-Smirnov p-value < 0.1; n=20). Additionally, our optimized deep learning classifier achieved a mean 5-fold cross-validation area under precision-recall curve score > 0.99 when classifying QoL subgroups at 12 month follow-up, using only baseline data. CONCLUSIONS: This work demonstrates the existence of time-dependent QoL-based ACP subgroups that can be inferred at time-of-diagnosis via machine learning analyses of baseline survey responses. The ability to predict an ACP patient's QoL trajectory affords caregivers valuable information that can be leveraged to maximize that patient's psychosocial state and therefore improve overall therapy.

QOL-23. ASSESSING THE IMPACT OF METHYLPHENIDATE ON LATE COGNITIVE EFFECTS IN PAEDIATRIC BRAIN TUMOUR SURVIVORS: A SERVICE-BASED EVALUATION

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OBJECTIVE: One of the most disabling side effects of treatment in survivors of brain tumours is the resultant reduction in level of processing speed and attention. This study aimed to evaluate intellectual and psychological benefit of short-acting methylphenidate to survivors of brain tumour. METHODS: Paediatric BT patients attending a UK specialist treatment centre received assessment of cognitive performance. All patients identified with attentional difficulties were screened for contraindications to methylphenidate. Participants (N=23), mean age 11.09 years, completed a 6-month trial of methylphenidate. Measures of attention (Test of Everyday Attention for Children 2; SNAP-IV), side-effects (Stimulant Side-Effects Rating Scale), Health-Related Quality of Life (PEDS-QL), and experience of methylphenidate questionnaire (purpose-developed semi-structured questionnaire) were administered prior to medication and after six months. RESULTS: Participants showed improvement in selective attention (t(18)=-5.4, p=<.001, d=.93) and processing speed (t(16)=-3.0, p=.01) at follow up. Family ratings of attention were significant (t(17)=14.46, p<.001, d=-1.19). Change in subjective measures of Health-Related Quality of Life (HRQoL) was also statistically significant as reported by children (t(16)=3.91, p=.001, d=-.99), and on a parental-report measure of child HRQoL (t(15)=-8.19, p<.001, d=-1.09). HRQoL measures show improvement to physical, academic, and emotional domains as reported by participants. CONCLUSIONS: Paediatric BT survivors showed benefit from provision of methylphenidate in terms of reduced attentional and processing deficit, and in terms of emotional wellbeing. Treatment was well tolerated. Continued follow-up of the current participants in a longitudinal study aims to evidence longer-term benefit to participants.

QOL-24. DIFFERENTIAL IMPACT OF TUMOR LOCATION, LOCAL AND CRANIOSPINAL IRRADIATION ON NEUROPSYCHOLOGICAL LONG-TERM OUTCOME IN CHILDREN WITH MEDULLOBLASTOMA, EPENDYMOMA AND SUPRATENTORIAL PNET: A LONGITUDINAL MULTICENTER OUTCOME ASSESSMENT OF CHILDREN FROM THE HIT-2000 AND HIT-REZ TRIALS

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Neurocognitive deficits are frequent in childhood brain tumor survivors and affect mental intelligence, psychomotor and executive abilities. The differential impact of factors such as disease (location, histology) or treatment (local *(LI) vs.* craniospinal irradiation (CSI)) on these parameters is not fully understood. Between 2007–2011 and 2013–2017 300 testings were performed on-site by one neuropsychologist. Of these, 274 tests from n=208 children with medulloblastoma (MB), ependymoma (EP) and supratentorial embryonal tumors (SET) <4 years at diagnosis are currently included into the analysis. Applied tests included the Bayley II, WUEP-KD, K-ABC, tapping speed (TS), CPT_Hits/CPT_DT, and, as a new score, CPT_Power which integrates the latter. Treatment consisted of surgery and chemotherapy ± LI/CSI. All children receiving CSI and MB children with LI showed substantial deficits in general intelligence scores. In contrast, children with MB or SET without CSI/LI and those with EP receiving LI performed surprisingly well after 2 and 5 years follow-up. Motor function (TS) was reduced in all children except those with SET without irradiation. Of note, mental processing speed (as measured in CPT_Power) was not essentially reduced in MB and EP patients, indicating that mental processing is less affected than motor speed (TS) in children with infratentorial tumors. In conclusion, our data show that besides the established detrimental effects of CSI on general intelligence, infratentorial tumor location is a main risk factor for motor dysfunction irrespective of irradiation. Appropriate sensitive testing tools are warranted to assess cognitive function without the interfering influence of motor dysfunction.

QOL-25. MICROSTRUCTURAL BRAIN CHANGES ASSOCIATED WITH NEUROCOGNITIVE AND FUNCTIONAL OUTCOMES OF INTRACRANIAL GERM CELL TUMUOR SURVIVORS – A DIFFUSIONAL KURTOSIS IMAGING STUDY

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BACKGROUND: Childhood intracranial germ cell tumour (iGCT) survivors are prone to radiotherapy-related neurotoxicity which can lead to neurocognitive dysfunction. Diffusion kurtosis imaging (DKI) is a MRI technique that quantifies microstructural changes in the grey and white matter of the brain. This study aims to investigate the associations between MR-DKI metrics, the cognitive and functional outcomes of childhood iGCT survivors. METHOD: 20 childhood iGCT survivors who had received cranial radiotherapy were recruited. DKI parameters were determined for iGCT survivors and 18 control subjects. Neurocognitive assessment using the Hong Kong Wechsler Intelligence Scales for Children (HKWISC)/ Wechsler Adult Intelligence Scale – Revised (WAIS-R) and functional assessment using the Lansky/ Karnofsky performance scales were performed for GCT survivors. RESULTS: There were significant negative correlation between the IQ scores and the mean diffusivity (MD) in multiple white matter regions of iGCT survivors including: anterior limb of internal capsule, superior fronto-occipital fasciculus, anterior corona radiata, uncinate fasciculus, cingulum and hippocampus. Mean kurtosis (MK) values of the superior fronto-occipital fasciculus were positively correlated with IQ scores. For grey matter, the MD of the olfactory, insula, caudate, heschl gyrus, parahippocampal gyrus, hippocampus, anterior cingulum, frontal inferior operculum, middle and superior temporal gyrus, middle and superior frontal orbital gyri, cuneus and precentral gyrus were negatively correlated with IQ scores. Most of the microstructural changes with associated functional impairment were white matter regions. CONCLUSION: Our study identified vulnerable brain regions with significant white and grey matter microstructural changes that were associated with impaired cognitive function or deficits in physical functioning.

QOL-26. I'VE GOT FRIENDS NOW: PAEDIATRIC PATIENTS' EXPERIENCES OF METHYLPHENIDATE TREATMENT FOR NEUROCOGNITIVE LATE-EFFECTS ASSOCIATED WITH BRAIN TUMOUR

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BACKGROUND: Whilst rates of survival following paediatric brain tumour have increased, quality of survival continues to present a significant challenge to children and their families. The neurocognitive impact of cranial radiotherapy (CRT) in childhood upon future intellectual development is well established. Both CRT and chemotherapy are associated with medium-term slowed speed of cognitive processing, attention, and memory impairment, and with longer-term failure to achieve pre-morbid intellectual potential and low Health-Related Quality of Life (HRQoL).Methylphenidate is a psychostimulant drug shown to be effective in alleviating some of the neurocognitive symptoms of cancer treatment, however the subjective experience of paediatric participants is not reported. AIM: The current study aimed to explore the subjective experience of HRQoL in paediatric neuro-oncology patients currently receiving methylphenidate. METHODS: A retrospective audit was conducted on 12 paediatric neuro-oncology patients in receipt of methylphenidate. Both standardised and novel measures were used to assess aspects of HRQoL, specifically; social life, perceived independence, mood, confidence, school life, self-esteem, interpersonal relationships and fatigue levels. Data collected were analysed using Thematic Analysis. RESULTS: Five key themes were identified; physical, emotional, social, academic and neuropsychological impact. CONCLUSION: The current findings evidence the perception of patients that methylphenidate supported them to regain previously lost functionality. Methylphenidate has the potential to increase HRQoL in this population and to provide children with the opportunity to regain a sense of normality in their lives.

QOL-27. SWALLOWING ASSESSMENT IN PEDIATRIC PATIENTS WITH BRAIN TUMOR

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BACKGROUND: Neurosurgical intervention is the initial modality of treatment for the vast majority of pediatric brain tumors. However, studies on the swallowing process in pediatric patients with brain tumors are scarce, especially comparing changes that can be identified before and after surgery. In clinical practice, it is possible to observe that these patients may present modifications in the swallowing phases both before and after surgery. Therefore, we conducted a longitudinal study with a cohort of 20 patients ranging in age from 0 to 17 years, in order to characterize the swallowing disorders. RESULTS: 30% of the patients presented some change in orofacial motricity in the organs related to initiation, coordination, and maintenance of swallowing at the time of hospital admission, and 65% of the patients exhibited these changes after surgery. Due to worsening in swallowing after surgery, 40% of the patients required modification of the consistence of oral diet or required the use of an alternative route of feeding. CONCLUSIONS: There is a high prevalence of swallowing disorders in pediatric patients with brain tumors, mainly regarding the proper functioning of organs related to initiation, coordination, and maintenance of swallowing even before the surgical intervention, and these changes increase after surgery - especially in patients with posterior fossa tumors. The role of the speech/language pathologist is of paramount importance, given their role in the assessment and adequacy of the feeding route, identifying patients at risk of pulmonary aspirations, minimizing swallowing complications, and also facilitating communication with patients and their families.

QOL-28. NEUROCOGNITIVE PROFILE OF PEDIATRIC MEDULLOBLASTOMA PATIENTS PRIOR TO RADIATION THERAPY

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Neurocognitive late effects are unfortunately common following treatment for pediatric medulloblastoma. While radiation therapy is an essen-