QOL-49. THE IMPACT OF OTOTOXICITY AND VISUAL IMPAIRMENT ON EDUCATION IN CHILDREN TREATED FOR CNS TUMOURS
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INTRODUCTION: Children treated for CNS tumours experience a very high burden of adverse effects. Platinum-based chemotherapy and cranial radiotherapy can cause ototoxicity, which may be particularly problematic in patients who have impaired vision and cognition as a result of their tumour and associated treatment. This study assessed the prevalence of impaired hearing and vision and how this may impact upon education. METHODS: 33 patients diagnosed with solid tumours in Edinburgh, UK between August 2013-2018 were included in the study. Patients were split into three groups according to treatment received: Group 1 – cisplatin-based chemotherapy and cranial radiotherapy; Group 2 – platinum-based chemotherapy, no cranial radiotherapy; Group 3 – benign brain tumours treated with only surgery. Data was collected retrospectively to provide notes. RESULTS: Overall 69.5% of those treated with platinum-based chemotherapy experienced ototoxicity as assessed by Brocx grading and 5.9% of patients had reduced visual acuity. Patients in Group 1 had the highest prevalence of both. 44.4% of patients in Group 1 needed increased educational support following treatment, either with extra support in the classroom or being unable to continue in mainstream school. 12.5% of Group 2 patients required such support and 31.3% in Group 3. CONCLUSIONS: Children CNS tumours frequently require support for educational difficulties, but those treated with both platinum-based chemotherapy and cranial radiotherapy are at particular risk, which may be compounded by co-existent ototoxicity and visual impairment. It is essential to provide appropriate support for this patient cohort in order to maximise their educational potential.

QOL-51. LISTENING BEFORE WE SPEAK: A PATIENT-CENTERED APPROACH TO DEVELOPING RESOURCES FOR PEDIATRIC BRAIN TUMOR SURVIVORS AND THEIR FAMILIES
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In the United States, more than 28,000 children and teenagers live with the diagnosis of a primary brain tumor (Porter, McCarthy, Freels, Kim, & Davis, 2010). In 2017, an estimated 4,820 new cases of childhood primary brain and other central nervous system tumors were expected to be diagnosed, with children 0 – 19 in the United States, Registry of the United States, 2017). Survivors suffer from lifelong side effects caused by their illness or by various treatments. Commonly identified late effects of treatment include a decline in intellectual functioning and processing speed, emotional IQ deficits, memory deficits, psychological difficulties, deficits in adaptive functioning (daily life skills), and an overall decrease in health-related quality of life (Castellino, Ulrich, Whelen, & Lange, 2014). To address the ongoing challenges these survivors and their families face, the Pediatric Brain Tumor Foundation (PBTF) met extensively with working groups comprised of survivors and caregivers to develop the outline for a comprehensive Survivorship Resource Guidebook. In 2019, the PBTF published the guidebook which categorizes survivor and caregiver needs into three primary areas: physical and mental health, quality of life, and working the system. Expert authors included survivors and caregivers themselves in addition to medical and mental health professionals. Key outcomes discovered during the creation and production of this resource highlighted that survivors and professionals can collaborate to provide the needed information and practical help to one segment of the pediatric cancer population who experience profound morbidities as a result of their diagnosis and treatment.

QOL-53. GENOME ASSOCIATIONS WITH NEUROCOGNITIVE OUTCOMES, CEREBRAL MICROBLEEDS (CMBs), AND BRAIN VOLUME AND WEIGHT MATTER (WM) CHANGES IN PEDIATRIC BRAIN TUMOR SURVIVORS
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OBJECTIVE: To identify genetic predictors of neurocognition, CMBs, brain volume, and WM changes in pediatric brain tumor survivors. METHODS: Patients were selected from an existing cohort of children treated for one neurocognitive condition (tested against computer-basedCogState; 2) available DNA; 3) standard imaging. Candidate gene or genome-wide genotyping was performed on all patients. CMBs were identified using a semi-automated algorithm developed in MATLAB. Volume of T2/FLAIR WM signal abnormality was measured using a semi-automated method based on a convolutional neural network. Brain volume and cortical thickness were measured using FreeSurfer volumetric analysis. Logistic and linear regression were used to compare phenotypes with candidate genotypes. Genome-wide efficient mixed-model analysis was done to compare neurocognition and CMBs. Gene set analysis was done using https://ftuma.citlab.nl/. RESULTS: APOE4 was a candidate variant associated with non-lofailar, larger volume CMBs (p<0.05). At the GWAS-level n=225, specific genes trended with visual memory, psychomotor function, and CMB count (p<3x10^-3). Using gene set analyses, there were gene sets trends seen with CMB count and psychomotor function. Small sample size and low mutant allele frequency limited reliability of these findings. Preliminary volumetric analysis showed reduced brain volume within the right parietal, medial occipital and inferior temporal lobes with increased cortical thickness in the left occipital and medial parietal lobe in patients carrying the ApoE4 allele. WM signal assessments are ongoing. CONCLUSION: Genetic markers may be associated with neurocognition, CMBs, brain volume and WM changes in pediatric brain tumor survivors; however, larger cohorts are needed to confirm specific gene relevance.

QOL-54. HEIGHT, WEIGHT AND CARDIOVASCULAR EFFECTS OF STIMULANTS ON CHILDREN WITH BRAIN TUMOR
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INTRODUCTION: Children with brain tumors may develop inattention, slow processing, and hypersomnia. Stimulant medications improve these problems but their effect on growth, heart rate, and blood pressure are inadequately explored. METHODS: We retrospectively studied children with brain tumors treated at our institution that had data available for one year pre and two year post stimulant treatment. Tumor location, gender, radiation treatment (RT), age at RT, drug type, and hormone therapy were variables of interest. RESULTS: We identified 63 children (35 males) that fulfilled eligibility criteria. Focal RT was utilized in 38; 11 additionally received whole brain RT. Thirty were treated for hypersomnia and inattention, 44.4% of patients in Group 1 needed increased educational support following treatment, either with extra support in the classroom or being unable to continue in mainstream school. 12.5% of Group 2 patients required such support and 31.3% in Group 3. CONCLUSIONS: Patients treated with both platinum-based chemotherapy and cranial radiotherapy may be at high-risk for co-existing ototoxicity and visual impairment. It is essential to provide appropriate support for this patient cohort in order to maximise their educational potential.

QOL-55. INTEGRATED MULTI-SCALE MODEL FOR PEDIATRIC BRAIN TUMOR SURVIVAL PREDICTION
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Brain tumors are the most common solid tumors affecting children, and its prognosis has been a great challenge for physicians and researchers. With the development in high-throughput sequencing technology and data analysis, more quantitative data is now becoming available and more information may potentially be discovered in whole slide images (WSIs) and molecular tumor characteristics to determine survival and treatment. Imaging and genomic data, though very different in nature, both contain distinctive characteristics that are important for survival prediction. Hence our work aims to build a framework to integrate two data modules, whole-slide histopathology image data, and RNA sequencing data, for a unified model to improve pediatric brain tumor survival outcome prediction. The imaging data and genomic data are both of high dimensions and on different scales. We use two independent
QOL-56. THE RELAPSED AND OR PROGRESSED BRAIN TUMOURS IN CHILDREN: RHC, GLASGOW EXPERIENCE
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INTRODUCTION: The outcome for children with relapsed or progressed brain tumours is poor. The aim of this project was to identify total number of children who have relapsed or progressed with Brain tumour and to determine the types of tumours, treatment offered and assess outcome. METHODS: This is a retrospective study of all patients treated for relapsed or progressed brain tumours between 2007 and 2017 at the Royal Hospital for Children. Patients were identified using the unit database. Clinical data included demographics, histologic diagnosis, treatment characteristics and outcome which was obtained from electronic records. RESULTS: 46 children were included (22M:24F). The median age of diagnosis was 5 years. There are 29 anaplastic subtypes of brain tumours: pilocytic astrocytoma (n=12, 26%), optic pathway glioma (n=4,7%), medulloblastoma (n=8, 17%), ependymoma (n=4, 9%), high grade glioma (n=3, 7%, DIPG (n=2, 4%) and others (13, 22%). 28/61% had relapsed at a median time of 18 months. Tumour progression occurred in 18/31%, at a median time of 21.5 months. Post-relapse or progression therapy included surgery (14, 30%), chemotherapy (17, 40%) and radiotherapy (5, 9.8%). 50% of the patients remain alive with 17.3% being stable and 6.13% with progression of disease. 50% had died of disease progression. CONCLUSIONS: The time of relapse and progression was seen 61% of patients. The commonest tumours in this cohort were pilocytic astrocytoma and medulloblastoma. Chemotherapy was the most used regimen followed by surgery and radiotherapy. Primary dissemination at the time of diagnosis was associated with poor prognosis.

QOL-57. SOUTHERN CALIFORNIA KAISER PERMANENTE PEDIATRIC NEURO-ONCOLOGY PROGRAM DEVELOPMENT
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KEY MESSAGE: Standardization of care for subspecialty patients require centralization and support across multi-disciplinary groups within the hospital for children. Patients were identified using the unit database. Clinical data included demographics, histologic diagnosis, treatment characteristics and outcome which was obtained from electronic records. METHODS: The Kaiser Permanente Southern California Pediatric Neuro-Oncology Program included 46 children who were diagnosed with brain tumors from 2011 to 2017. RESULTS: 46 children were included (22M:24F). The median age of diagnosis was 5 years. There are 29 anaplastic subtypes of brain tumours: pilocytic astrocytoma (n=12, 26%), optic pathway glioma (n=4,7%), medulloblastoma (n=8, 17%), ependymoma (n=4, 9%), high grade glioma (n=3, 7%, DIPG (n=2, 4%) and others (13, 22%). 28/61% had relapsed at a median time of 18 months. Tumour progression occurred in 18/31%, at a median time of 21.5 months. Post-relapse or progression therapy included surgery (14, 30%), chemotherapy (17, 40%) and radiotherapy (5, 9.8%). 50% of the patients remain alive with 17.3% being stable and 6.13% with progression of disease. 50% had died of disease progression. CONCLUSIONS: The time of relapse and progression was seen 61% of patients. The commonest tumours in this cohort were pilocytic astrocytoma and medulloblastoma. Chemotherapy was the most used regimen followed by surgery and radiotherapy. Primary dissemination at the time of diagnosis was associated with poor prognosis.

QOL-58. ASSESSING FATIGUE EXPERIENCED BY PEDIATRIC PATIENTS WITH INTRACRANIAL NEOPLASMS
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BACKGROUND: Indiana University possessed one of the earliest clinical proton facilities in the United States. The purpose of this study was to assess fatigue and nausea/vomiting in children with central nervous system (CNS) tumours undergoing radiation therapy as part of their treatment regimen, and to understand what factors influence fatigue. DESIGN: The study was approved by the institutional review board at Indiana University and consent and/or assent from eligible participants was obtained prior to enrollment. The validated Fatigue Scale is scored on a 5-point Likert scale. Surveys were completed 1) prior to radiation therapy, 2) week three of radiation therapy and 3) week six of radiation therapy. RESULTS: The Fatigue Score for the Fatigue-Scale Parent (< 7 years), 12 or higher for the Fatigue Scale-Child (8–12 years), and 17 or higher for the Fatigue Scale-Adolescent (13–18 years), indicates significant cancer-related fatigue. RESULTS: The study aimed to recruit a total of 50 patients during the eligible period. However, data on 31 individual participants were available for analysis. 25 patients underwent proton radiation therapy, while 6 patients underwent conventional photon therapy. The mean age of children was 8.8 years. Of the 31 patients, 22 recorded scores indicating significant cancer-related fatigue at some point during radiation therapy. CONCLUSIONS: Cancer related fatigue continues to be a challenge, with limited understanding of factors that might predict clinically relevant fatigue. This work demonstrates the feasibility of conducting symptom research for children undergoing radiation therapy; further research is needed to characterize predictors of fatigue.