

Children's Hospital collected baseline data on patients referred for concerns of attention deficits co-occurring with diagnosed neurologic illness/injury, or neurodevelopmental disorder (NDD). **Methods:** The Behaviour Rating Inventory of Executive Function (BRIEF-2), Behaviour Assessment System for Children (BASC-3), Parenting Stress Index (PSI-4) and medical and past treatment information were collected on initial clinic visit for patients aged 5-15 years. **Results:** BRIEF-2 Global Executive Composite demonstrated 88.9% of children had clinically elevated scores. Clinically significant scores were observed in 55.5% for BASC-3 Adaptive Skills index and 40% of parents in PSI-4 Total Stress scores. **Conclusions:** Children with neurologic illness/NDDs are at high risk of clinical impairments in attention and EF. In children referred for attention and behavioural regulation, there is clinically significant increased reporting of executive function impairment out of proportion to other behavioural difficulties. The clinic aims to improve overall functioning through treatment of unmanaged attention and EF deficits.

## CLINICAL NEUROPHYSIOLOGY (CSCN)

### EPILEPSY AND EEG

#### P.125

##### **Discriminating sharp-wave ripples and interictal epileptiform discharges in patients with mesial temporal epilepsy using intracranial EEG recordings**

*N Mortazavi* (London)\* *M Khaki* (London) *G Gilmore* (London) *J Burneo* (London) *D Steven* (London) *J Martinez-Trujillo* (London), *A Suller-Marti* (London)

doi: 10.1017/cjn.2021.401

**Background:** Interictal epileptiform discharges (IEDs) are known as epilepsy biomarkers for seizure detection, and it is essential for clinicians to detect them from physiological events with similar temporal frequency characteristics. **Methods:** We analyzed the SEEG recordings obtained from patients with medically-resistant epilepsy (MRE) implanted with DE at the Western University Hospital Epilepsy Unit. The data were cleaned, denoised, montaged and segmented based on the clinical annotations, such as sleep intervals and observed Ictals. For event detection, the signal waveform and its power were extracted symmetrically in non-overlapping intervals of 500 ms. Each waveform's power across all detected spikes was computed and clustered based on their energy distributions. **Results:** The recordings included thirteen sessions of 24 hours of extracellular recordings from two patients, with 312 hours extracted from four hippocampus electrodes anterior and posterior hippocampus. Our results indicate IEDs carrying the most different characteristics in the bands [25-75] Hz; SWR, on the other hand, are distributed between [80-170] Hz. **Conclusions:** Our algorithm detected and successfully distinguished IED from SWRs based on their carrying energy during non-sleep periods. Also, the most powerful spectral features that they were distinguished from occur in [15-30] Hz and [75-90] Hz.

#### P.126

##### **Incorporation of Objective Structured Clinical Examination into EEG/Epilepsy Fellowship Training**

*K Myers* (Montreal)\*

doi: 10.1017/cjn.2021.402

**Background:** For over 40 years, the objective structured clinical examination (OSCE) has been a part of medical education, eventually finding its way into most aspects of clinical training and evaluation. However, the EEG/epilepsy fellowship training has not classically involved OSCE evaluations. **Methods:** We designed and implemented a formative OSCE for pediatric and adult EEG/epilepsy fellows in Montreal, Quebec, Canada. The examination was offered in French and English. Stations included: technical issues, short cases, a long case, and communication. We solicited post-examination feedback from all participants via anonymous electronic survey after they had completed the Canadian Society for Clinical Neurophysiology (CSCN) EEG examination. We asked questions surrounding utility of the examination, areas for improvement, and whether the participant had been successful in passing the CSCN examination. **Results:** Six fellows took the initial formative OSCE. All six reported passing the subsequent CSCN examination. All participants reported the OSCE as useful in examination preparation. The communication station was consistently ranked as the least useful station, an unsurprising finding given that the CSCN examination does not involve a communication component. **Conclusions:** OSCE is an effective tool in assessment of the level of competence of EEG/epilepsy fellows, and as preparation for the CSCN EEG examination.

#### P.127

##### **Ultra-high field 7-Tesla magnetic resonance imaging and electroencephalography findings in epilepsy**

*F Salehi* (Hamilton)\* *BY Kwan* (Kingston) *SM Mirsattari* (London) *DH Lee* (London) *JG Burneo* (London) *D Steven* (London) *R Hammond* (London) *TM Peters* (London), *AR Khan* (London)

doi: 10.1017/cjn.2021.403

**Background:** Assessment of patients for temporal lobe epilepsy (TLE) surgery requires multimodality input, including EEG to ensure optimal surgical planning. Often EEG demonstrates abnormal foci not detected on clinical MRI. 7T MRI provides improved resolution and we investigated its utility to detect potential abnormalities associated with EEG. **Methods:** Images were acquired on 7T MRI scanner (N=13) in patients with TLE. Evaluation of 7T MRI findings for focal abnormalities was performed. Correlation of 7T MRI findings with EEG of focal slowing or interictal epileptic spikes (IEDs) and seizures was performed. **Results:** Assessment of 7T MRI demonstrated concordance with TLE in 8/13 cases. Three cases exhibited abnormal 7T MRI abnormalities not detected by 1.5 T MRI. Eleven out of 13 cases had EEG findings without anatomic correlates on MRI, with IEDs localizing to contralateral temporal, frontal, and parieto-occipital lobes. 7T images did not reveal focal anatomical abnormalities to account for the EEG findings in these patients. **Conclusions:** To our knowledge, this is the first study to

investigate the role of 7T MRI in relation to EEG abnormalities. 7T RI findings show concordance with clinical data. 7T MRI did not reveal anatomical findings to account for EEG abnormalities, suggesting that such changes may be functional rather than anatomical.

## P.128

### Quantitative EEG Detects REM Sleep Microstructure

*D Toutant* (Winnipeg)\*, *M Ng* (Winnipeg)

doi: 10.1017/cjn.2021.404

**Background:** Rapid eye movement sleep (REM) is divided into phasic and tonic microstates. Phasic REM is defined by presence of REMs with reportedly greater antiepileptic effect. We assessed whether quantitative EEG (QEEG) software can detect REM microstates. **Methods:** We applied artifact reduction and detection trends from QEEG software (Persyst 14) on 18 patients undergoing 30 day-night high density EEG recordings in the epilepsy monitoring unit. We identified phasic REM as 10-second epochs of previously human-scored REM that demonstrated presence of either vertical or horizontal eye movements on the QEEG artifact detection panel. Remaining epochs were identified as tonic REM. **Results:** Out of 91.2 average minutes of REM (range 24.5-167.5) per recording, a mean of 2.5% (range 0-18.9%) demonstrated eye movements intensive enough for QEEG artifact detection to be identified as phasic REM. On average, only 40% (range 0-500%) of eye movements per recording was flagged as vertical. **Conclusions:** These findings provide proof-of-concept that QEEG can automatically assess REM microstructure by readily detecting phasic and tonic REM. These findings also confirm that most REMs are horizontal. Having the ability to easily and automatically detect phasic versus tonic REM can help further future studies examining the antiepileptic effect of REM sleep.

## MULTI-SOCIETY

### EPILEPSY AND EEG

## P.129

### Bi-insular Responsive Neurostimulation Artifact on Scalp Electroencephalogram

*EM Paredes-Aragón* (London)\* *M Chávez-Castillo* (London) *GL Barkley* (Detroit) *JG Burneo* (London), *A Suller-Martí* (London)

doi: 10.1017/cjn.2021.405

**Background:** Responsive Neurostimulation (RNS) has proven efficacy in treating medically resistant epilepsy as an intracranial system detecting, recording and treating seizures automatically. No information exists pertaining to artifact characteristics of RNS findings in scalp EEG. **Methods:** A 30

year-old female was diagnosed using intracranial electroencephalography (iEEG), with bi-insular epilepsy, of unknown cause. She presented large number of focal unaware non-motor seizures and seizures with progression to bilateral tonic-clonic. She was implanted with bi-insular RNS. **Results:** During scalp EEG recordings, a prominent artifact was seen corresponding to an automatized discharge suspectedly evoked by the RNS trying to minimize the frequent epileptiform activity in her case. Figure 1 and 2 depict these findings. **Conclusions:** Artifact seen by the RNS in scalp EEG has not been previously described in scientific literature. These findings must be identified to better characterize the role of the RNS in EEG and treatment of seizure activity visible on scalp recordings.

## NEURO-ONCOLOGY

## P.130

### Clinical prognostic factors in adult intracranial ependymoma patients – A fifty year multi-institutional experience

*JA Zuccato* (Toronto)\* *O Algan* (Oklahoma City) *V Nair* (Ottawa) *T Gunter* (Oklahoma City) *CA Glenn* (Oklahoma City) *IF Dunn* (Oklahoma City) *K Fung* (Oklahoma City) *DB Shultz* (Toronto) *G Zadeh* (Toronto) *N Laperriere* (Toronto), *DS Tsang* (Toronto)

doi: 10.1017/cjn.2021.406

**Background:** Standard of care treatment for adult intracranial ependymoma patients includes maximal safe surgical resection, while the role for adjuvant radiotherapy remains unclear with existing data from small retrospective series'. Accordingly, we built a multi-institutional cohort to assess the prognostic value of adjuvant radiotherapy and other clinical factors in these patients. **Methods:** Patients managed for adult intracranial ependymomas from 1968 onwards within the University Health Network in Toronto, The University of Oklahoma Health Sciences Center, and The Ottawa Hospital were identified. Multivariate models assessing the prognostic value of clinical factors were built using variables with known prognostic value and/or significance in univariate Cox models. **Results:** Of 122 ependymomas, 71% were infratentorial, 78% grade two, 55% gross/near-totally resected (GTR/NTR), and 65% treated with adjuvant radiotherapy. Multivariate analyses identified GTR/NTR (vs. subtotal resection; HR=0.2, 95%CI=0.1-0.4, p<0.0001) and cranial (HR=0.5, 95%CI=0.2-1.1) or craniospinal (HR=0.2, 95%CI=0.04-0.5) radiotherapy receipt (p=0.01) as independent statistically significant predictors of more favourable PFS. Grade II pathology (vs. grade III; HR=0.2, 95%CI=0.05-0.6, p=0.006) and GTR/NTR (vs. subtotal resection; HR=0.1, 95%CI=0.03-0.3, p=0.0001) were independent statistically significant predictors of better OS. **Conclusions:** This work confirms the importance of maximal safe resection for adult intracranial ependymomas and establishes that adjuvant radiotherapy improves progression-free survival in these patients.