pre- and post-operative neuropsychological assessment was performed. *Results:* The TSG had significant atrophy by 12% of the unresected cHC ($p<0.0001$) most pronounced (27%) in the hippocampal body alone. The LG revealed that this atrophy occured rapidly over the first week (1.3%/day; 3%/day cHC body). Significantly greater cHC atrophy was observed in those with ongoing seizures versus the seizure free ($p=0.048$). *Conclusions:* Significant cHC atrophy following TLE surgery that begins immediately, progresses over the first week, and remains signficantly depressed. The severity postoperative cHC atrophy may represent an early biomarker of the propensity for delayed seizure recurrence.

C.04

CNSS K.G. McKenzie Memorial Prize in Basic Neuroscience Research (2nd place)

Motor cortex electrical stimulation to promote spinal cord injury repair in an animal model

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Background: Electrical stimulation (ES) to promote corticospinal tract (CST) repair has been recently examined, though remains under investigated. We examine the role of motor cortex ES on axonal re-growth and functional recovery in a spinal cord injury (SCI) rat model. *Methods:* A partial transection was performed at C4 in 48 rats. Animal groups included: ES333 rats (n=14; 333Hz, biphasic pulse, 0.2ms every 500ms), ES20 (n=14; 20Hz, biphasic pulse, 0.2ms every 1ms), SCI only (n=10), and sham (n=10; electrode insertion without ES). Rats were trained in stairwell-grasping with subsequent SCI and ES. Post-injury reaching scores were recorded weekly, and histology completed quantifying axonal re-growth. *Results:* Post-SCI grasping ($p<0.01$, ANOVA) and well reached were lower than baseline values ($p<0.01$, ANOVA) for all groups. ES20 animals had lower grasping scores ($p=0.03$, ANOVA) and farthest well reached scores post-SCI than controls ($p=0.03$, ANOVA). ES333 rats had more axonal collaterals (axonal sprouts rostral to lesion) compared to control animals ($p<0.01$, M-W). No difference was found between groups with respect to axonal regeneration into the lesion ($p=0.13$, ANOVA). *Conclusions:* Cortical ES of the injured CST results in greater axonal outgrowth, and influences functional outcomes depending on ES parameters. ES is a potentially promising SCI therapy, but further investigation is required.

C.05

Canadian neurosurgery operative landscape

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Background: The Canadian Neurosurgery Research Collaborative (CNRC) is a trainee-led multi-centre collaboration made up of representatives from 12 of 14 neurosurgical centres with residency programs. To demonstrate the potential of this collaborative network, we gathered administrative operative data from each centre in order to provide a snapshot of the operative landscape in Canadian neurosurgery. *Methods:* Residents from each training program provided adult neurosurgical operative data for the 2014 calendar year, including the number of surgeries in the subcategories cranial, spinal, and peripheral nerve. Because some residency programs have surgeries distributed among more than one hospital, we calculated mean case load per residency program and per hospital. *Results:* Interim results from 6 neurosurgery residency programs are presented (with data from other programs forthcoming). Overall, there were on average 2,352 operative cases per residency program (n=6) and 1,176 operative cases per adult hospital (n=12). Among 5 programs with more detailed operative data, the mean numbers of cranial, spinal, peripheral nerve, and miscellaneous surgeries per residency program were 757 (47%), 487 (30%), 47 (3%), and 319 (20%) respectively. *Conclusions:* We show as a proof-of-concept that a trainee-led nation-wide research collaborative can generate meaningful data in a Canadian context.

C.06

Surgical resection of pediatic posterior fossa tumours in the molecular era

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Background: Aggressive surgical resections of posterior fossa tumours result in tremendous neurological sequelae as a result of damage to the brainstem. As such we sought to re-evaluate the role of aggressive surgical resections in the molecular era. *Methods:* 820 posterior fossa ependymoma and 787 medulloblastoma were genomically profiled and correlated with pertinent clinical variables. *Results:* Across 787 medulloblastoma cases, the value of extent of resection was greatly dampened when accounting for molecular subgroup. Near-total resections are equivalent to gross total resections across all four subgroups even when correcting for treatment. The prognostic value of a gross total resection as compared to a subtotal resection (>1.5cm2 residual) was restricted to Group 4 tumours (HR 1.26). Across 820 posterior fossa ependymoma PFA ependymoma was a very high risk group compared to PFB ependymoma, and a subtotal PFA ependymoma conferred an extremely poor prognosis. Gross totally resected PFB ependymoma could be cured with surgery alone. Prognostic nomograms in both medulloblastoma and ependymoma revealed molecular subgroup to be the most important predictor of outcome. *Conclusions:* The prognostic benefit of EOR for patients with medulloblastoma is marginal after accounting for molecular subgroup affiliation. In both molecular subgroups of posterior fossa ependymoma, gross total resection remains an important predictor of outcome.

C.07

Door to decompression should be the benchmark in trauma craniotomies

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Background: Quality control indicators for mass lesion in TBI use the delay between emergency department (ED) and OR arrival

to measure quality of care. It does not provide the timing of brain decompression. The goals of this study are to observe step by step where delays occur from hospital admission until effective decompression of the brain. *Methods:* A prospective observational data collection of timing from ED admission to decompression was conducted for all emergency trauma craniotomies over a period of 15 months. *Results:* Sixty-five patients were included. Doing a CT at the outside institution instead of transferring the patient prior to CT resulted in a 112min delay in care. Neurosurgery team notification prior to patient's arrival to ED shortened delivery of care by 51min. The time elapsed between OR arrival and brain decompression was 50min: anesthesia time 3min, surgical positioning/preparation 29min and surgical time 17min. Burrhole decompression followed by craniotomy (9min) shortened the decompression time by 17min compared to standard 4 holes craniotomy approach (26min). *Conclusions:* Benchmark for trauma system performance in emergency craniotomies should be door to decompression time. Bypassing CT in local hospitals, pre-alerting neurosurgeons, and burrhole decompression followed by standard craniotomy significantly decrease door to decompression time.

CACN/CSCN Platform Presentations

D.01

Earlier treatment with the Ketogenic Diet improves seizure outcome in early-onset drug-resistant epilepsy

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doi: 10.1017/cjn.2016.74

Background: The ketogenic diet (KD) is used to treat severe childhood-onset epileptic encephalopathies, such as Infantile Spasms (IS). Unfortunately, limited resources for KD initiation result in treatment delays. We ask if earlier KD treatment of early-onset drug-resistant epilepsy results in better seizure outcomes. *Methods:* Children who started KD before age 4 years between 2000-present at SickKids Hospital were identified. Six-month seizure outcome was calculated as percent of pre-diet baseline seizure frequency (BSF). *Results:* 67 children were identified. 30 (44.8%) started KD <2 years old, 37 (55.2%) started KD 2-4 years old. Among <2 years old group, 83.3% achieved 50% reduction in BSF and 36.7% achieved 90% reduction. Among 2-4 year old group, 62.2% achieved 50% reduction in BSF and 24.3% achieved 90% reduction. 38 children had a history of IS; 17 with IS at diet initiation and 21 with past history of IS. 41.2% of the spasms cohort achieved 90% reduction in BSF, compared to 23.8% of the post-spasms cohort. *Conclusions:* KD was more effective when started before age 2 years than 2-4 years, and more effective in children with IS than in children with past history of IS. A rapid protocol for KD initiation in young infants and children may improve long-term outcomes

D.02

Predictive factors for epilepsy in pediatric patients with Sturge Weber Syndrome

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Background: Sturge Weber Syndrome (SWS) patients at risk of epilepsy are often not identified before their first seizure which leads to unnecessary follow up of many patients with facial angioma. *Methods:* The medical photography database of our institution has been reviewed to identify SWS patients followed between 1993 and 2013. Patients with isolated glaucoma were compared to patients with epilepsy regarding the location of the facial angioma, the presence of asymmetrical background activity on EEG done prior epilepsy onset and cerebral imaging. Logistical regression tests and a p-value of 0.05 were used. *Results:* 21 patients with SWS have been identified. No significant difference was noted when patients were compared based on the laterality of the lesion (p=0.169), or the location of the facial angioma (p = 0.314 to 0.999). Only 2 epileptic patients had digital EEG done prior the onset of epilepsy and only 2 patients with glaucoma had digital EEG done during their follow up. No significant difference was noted between EEG background activities in the two groups (p= 0.514). The presence of venous drainage anomalies (VDA) predicted (p = 0.004) the onset of epilepsy. *Conclusions:* Cerebral VDA increases the risk of epilepsy in SWS patients. Since they can be detected at birth, they might guide the management.

D.03

Down syndrome: clinical and EEG correlates during development

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Background: Down syndrome (DS) is the primary genetic cause of mental retardation and seizures are present in an estimated 5-13% of cases. One-third of seizures in DS are infantile spasms (IS). Hypsarrythmia (HS) is the cardinal electroencephalogram (EEG) feature of IS and has been found to affect cognition; however, its effect on DS patients is inconclusively reported. This study assesses the correlation of HS with cognitive outcomes in DS using the largest sample size to date. *Methods:* Retrospective study of medical records of children with DS [0-18yrs] at SickKids Hospital in Toronto, from 1990-2013. Seizure history, EEG findings, comorbities, and pharmacological treatments were identified. Developmental outcomes were also assessed from physician comments on motor, verbal and cognitive abilities. The cognitive outcomes of DS patients with and without HS were compared. *Results:* 70 [male=40] patients with DS and seizures were included. Among 31 (44.2%) patients with DS and IS, 27 had HS. Chi-square analysis showed a significant difference [P=0.007] in prevalence of severe developmental delay in patients with IS and HS versus all other seizure types. *Conclusions:* The developmental outcome of patients with Down syndrome appears to worsen when IS and HS had occurred in the first year of life.