

severe morbidity in youth. GBS and TM were the most common diagnoses.

D.11

Trends in cerebral palsy in Saskatoon, Saskatchewan in the last four decades

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Background: Cerebral Palsy (CP) is a neurological condition arising from a perinatal or intra-uterine stroke. In the past 25 years there has been a revolution in neonatal care. For over 40 years children with CP in and around Saskatoon have been treated through the Kinsman Childrens' Centre (KCC). This is a unique population database covering all CP patients in the region. We analyzed the KCC database to determine if the recent changes in neonatal care were correlated with the incidence of CP co-morbidities. **Methods:** A retrospective study using a Saskatchewan database of cerebral palsy data from the last four decades. **Results:** Over the last 40 years the incidence of visual disturbance and diagnoses of epilepsy in children with CP have remained stable regardless of advances in neonatal care. However, incidences of spine and hip issues requiring orthopedic intervention have halved. **Conclusions:** We hypothesize that advances in neonatal care have been successful in decreasing the incidence of gross motor impairments however have yet to significantly impact impairments relating to cortical network function. Although improvements in care have resulted in a decreased burden of disability, there remains opportunity for further improvements, especially in the settings of epilepsy and long-term visual function.

CNS PLATFORM PRESENTATIONS

E.01

Lost productivity in stroke survivors: a new econometrics model

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Background: Stroke leads to a substantial societal economic burden. We aimed to characterize productivity and factors associated with employability in Canadian stroke survivors. **Methods:** We used the Canadian Community Health Survey (CCHS) 2010-2011 to identify stroke survivors and employment status. We used multivariable models to determine the impact of stroke on employment and factors associated with employability. We used the Heckman model to estimate the effect of stroke on productivity (number of hours worked/week and hourly wages). **Results:** We included data from 91,633 respondents between 18 and 70 years and identified 923 (1%) stroke survivors. Stroke survivors were less likely to be employed (adjusted Odds Ratio 0.39, 95% CI 0.33 to 0.46) and had hourly wages 17.7% (95% CI 8.3% to 27.1%) lower compared to the general population, although there was no association between work hours and being a stroke survivor. Older age, being single and having medical comorbidities

were associated with lower odds of employment in stroke survivors. **Conclusions:** Stroke survivors are less likely to be employed and earn a lower hourly wage than the general population. Interventions such as dedicated vocational rehabilitation and policies around return to work could be considered to address this lost productivity among stroke survivors.

E.02

Streamlining hyperacute stroke management at Royal University Hospital

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Background: The Saskatoon stroke program participated in the ESCAPE trial looking at rapid endovascular revascularization for large vessel occlusion. Improvements were necessary to meet the timelines mandates in ESCAPE and to comply with Canadian Best Practice Guidelines. **Methods:** Retrospective chart review and prospective gathering of key metrics was performed using RED-Cap (Research Electronic Data Capture) software. Changes adapted from Canadian Best Practice Recommendations for Stroke Care, the ESCAPE protocol, and the Calgary stroke program HASTE project were implemented. **Results:** Changes implemented included increasing ambulance bypass window to 12 hours, FAST stroke assessment, emergency department pre-notification and registration, stroke alert protocol, team swarm of the patient, administration of tPA in the computed tomography (CT) room, and rapid access to the endovascular suite. Total number of patients between the years 2012 and 2014 was 287, and of those, 93 received tPA. Door-to-CT times decreased from 40 minutes to 21 minutes from 2012 to 2014; and Door-to-Needle (tPA) decreased from 62 minutes to 46 minutes from 2012 to 2014. **Conclusions:** By following Canadian best practice recommendations for stroke care, the ESCAPE protocol, and adaptation of Calgary stroke program HASTE project, our stroke program implemented changes to reduce treatment times for patients experiencing stroke in our province.

E.03

Use of intra-arterial milrinone rescue therapy in patients with refractory and super refractory vasospasm after aneurysmal subarachnoid hemorrhage

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Background: Vasospasm causing delayed ischemic neurologic deficit (DIND) remains a leading cause of devastating outcome after aneurysmal subarachnoid hemorrhage (aSAH). Therapy using intravenous milrinone (IVM) and intra-arterial milrinone (IAM) has been described. We report our results using IAM in patients with refractory and super refractory vasospasm (RV and SRV respectively). **Methods:** Retrospective single center study of all adult patients treated with IAM between 2006 and 2016 inclusively. IAM was used as part of the Montreal Neurological Hospital Protocol when the patients'

symptoms failed to respond to initial and higher IVM doses. We report their clinical outcomes. *Results:* IAM was used in 19 patients. The median loading dose was 8 mg and average maintenance dose was 0.78 mcg/kg/min. Angiographic improvement was seen in 15 (79%) and clinical improvement - within the first 48 hours - was seen in all patients. The median mRS was 3 at time of discharge and 1 three months later. Five patients lost follow up. *Conclusions:* IAM appears to be safe and effective in this small retrospective series of RV and SRV complicating aSAH. Angiographic and clinical improvements were observed. Further prospective studies are warranted to confirm these findings.

E.04

Coma and delirium are associated with low levels of brain tissue oxygen in critically ill patients

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Background: The cause of ICU delirium is unknown. We used near infrared spectroscopy (NIRS) to measure brain tissue oxygenation (BtO₂) in critically ill patients, to test the hypothesis that poor cerebral oxygen delivery contributes to ICU delirium. *Methods:* Adult patients were enrolled if they required mechanical ventilation for >24 hours, and/or vasoactive agents. Patients were excluded if they had previous cognitive dysfunction, brain injury on admission, or a life expectancy <24 hours. BtO₂ was measured for the first 24 hours of ICU admission. The confusion assessment method-ICU (CAM-ICU) was used to screen for delirium. Participants were designated to one of three groups on the basis of their predominant neurological status (comatose, delirious, or intact). *Results:* To date, 47 patients have been recruited. Both delirious and comatose patients' had significantly lower BtO₂ levels compared to intact patients (P<0.001). There was a significant correlation between hemoglobin and BtO₂ (R²=0.347, P<0.01). However, when correlation analysis was conducted separately amongst the three groups, the delirious patients (R²=0.485, P<0.05) were the strongest contributors to this positive correlation. *Conclusions:* Delirious patients exhibited the lowest BtO₂ recordings and demonstrated a significant association between Hb and BtO₂. This study offers potential insight into the pathophysiology of ICU delirium.

E.06

Developing and evidence-based palliative care curriculum for neurology resident trainees

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Background: Graduating neurology residents require general palliative care skills. This study aims to develop an evidence-based palliative care curriculum to provide neurology residents with the general palliative care skills required for providing patient care along the continuum of life. *Methods:* A needs assessment of the palliative skills necessary for a neurology resident was performed. Focus groups were held with physicians, allied health care and senior residents. Semi-structured interviews were held with patients and their

caregivers. Interviews analysed using qualitative thematic analysis techniques. The Kolb learning style inventory will determine the learning style of neurology residents and inform the curricular design. *Results:* Qualitative analysis identified 3 overarching challenges for neurology residents: 1) *uncertainty* regarding disease trajectory in neurology and timing of palliative care discussions; 2) *cohesiveness* of the health care team regarding end of life issues; 3) *the role of the resident* in initiating palliative care. Other principals identified for inclusion were: symptom management, communication, psychosocial aspects of care, care coordination and access, and myths and pitfalls in palliative care. *Conclusions:* This project will identify the current best evidence and expert opinion in palliative care neurology. The data will be used to develop a novel Canadian neurological palliative care curriculum.

E.07

The role of the neurologist in advanced multiple sclerosis: the patient's perspective

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Background: Few evidence-based disease-modifying treatments exist for progressive multiple sclerosis (MS). How can neurologists best care for patients with advanced MS? Little is known about how patients with progressive MS view their relationship with their treating neurologist, and if the role of the neurologist matches their needs and preferences. *Methods:* A qualitative cross-sectional analysis of patient preferences regarding the role of the neurologist in their care. Patients with progressive MS and an EDSS score of 6 or more were invited to participate. Patients and caregivers completed separate written questionnaires and were then interviewed by one of the authors. Data were subjected to thematic coding to group common themes and the distribution of themes among different disability sub-groups was analyzed. *Results:* Full results will be available at the time of the conference. Preliminary results suggest that the neurologist has an important role in updating patients on the progress of their disease and responding to questions. Patients are fearful of becoming dependent on others for their care. The concept of palliative care is unfamiliar to most patients. *Conclusions:* Despite a lack of disease-modifying treatments for progressive multiple sclerosis, patients believe that the neurologist has an important role in their care.

E.08

Subcutaneous vs. intravenous immunoglobulins for chronic inflammatory demyelinating polyneuropathy and multifocal motor neuropathy

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Background: High-dose intravenous immunoglobulin (IV-Ig) is an evidence-based treatment for chronic inflammatory demyelinating polyneuropathy (CIDP) and multifocal motor neuropathy (MMN). Recently, subcutaneous Ig (SC-Ig) has received increasing attention. We performed a meta-analysis to assess the efficacy of SC-Ig versus IV-Ig. *Methods:* We