

tackling which accounted for 48.3% of all brain injuries $n=480$. *Conclusion:* Participation in rugby is rapidly increasing, and brain injury as a result of participation is a common occurrence. Possible changes to reduce injury include stricter penalties for high tackles to the head and neck area, and rules against blindside tackles.

P.072

A pilot study exploring pupil response measurement in mild traumatic brain injury

W Ting (Toronto)* J Topolovec-Vranic (Toronto) M McGowan (Toronto) MD Cusimano (Toronto)

doi: 10.1017/cjn.2015.181

Background: Pupillometry, the measurement of pupil response dynamics via the pupillary light reflex, is seldom used in the assessment of mild traumatic brain injury (mTBI). We hypothesized that there would be quantifiable differences in detailed pupil response measurements in patients with acute and chronic mTBI. *Methods:* We conducted 49 bilateral pupillometry measurements, in acute mTBI patients at 1-week ($N=11$), 2-4w ($N=9$), and 3-7mo post-injury ($N=3$); 14 patients with persistent post-traumatic symptoms (PTS) once, and healthy controls across a first visit ($N=7$) and second visit 2-4w later ($N=5$). *Results:* The percentage of left pupil diameter change was significantly greater in the acute mTBI group at second visit (mean=36.3% (2.96)), compared to controls at second visit (mean=31.6% (4.39)) ($F=5.87$, $p=0.0321$). We did not identify significant differences between acute mTBI patients and controls at first visit, PTS patients versus controls, and within the acute mTBI group across three longitudinal visits. *Conclusion:* While these preliminary data suggest that pupillometry under these conditions does not distinguish between patients who had a recent mTBI or those with PTS and healthy controls, further research is warranted investigating pupil behavior and its clinical utility in mTBI.

P.073

Compliance with brain trauma foundation (BTF) guidelines for management of traumatic brain injury (TBI) patients: systematic review and meta-analysis

YH Khormi (Edmonton)* C O'Kelly (Edmonton)

doi: 10.1017/cjn.2015.182

Background: TBI is a leading cause of death and disability. Management based on the BTF guidelines is widely accepted and thought to improve outcome. The objectives of this study were: 1) to review the rate of adherence to BTF guidelines; 2) to identify factors influencing adherence; and 3) to determine the effect of guideline-based management on outcome. *Methods:* We searched all electronic bibliographic databases. In duplicate and independently, two investigators screened titles, abstracts and articles to select appropriate studies reporting compliance rate, factors influencing compliance, and adjusted mortality or morbidity. Data extraction and assessment of bias risk were performed independently by both investigators. We excluded pediatric and military-related TBI studies. *Results:* A total of 30 articles met inclusion/exclusion criteria out of 1153 papers screened. Most are retrospective and cross-sectional observational studies; there were no randomized control trials. Preliminary analysis showed considerable variation in compliance rate with BTF

guidelines ranging from 5.6-96%. *Conclusions:* Variation in the care of TBI patients persists across the world. Compliance with BTF guidelines was strongly influenced by implementing a guidelines-based protocol. Heterogeneity of the article prevents outcome assessment. Well-conducted study to support the existing literature of the beneficial effect of current guidelines is needed.

NEUROSURGERY (GENERAL NEUROSURGERY)

P.074

Emergent and urgent transfers to neurosurgical centres: examining access in Ontario

Z Merali (Toronto)* S Sharma (Toronto)* R MacDonald (Mississauga) E Massicotte (Toronto)*

doi: 10.1017/cjn.2015.183

Background: Critically ill neurosurgical patients require expedient access to neurosurgical centers (NC) to improve outcome. In Ontario, many patients are initially evaluated at a non-neurosurgical center (NNC) and subsequently transferred to a NC by a provincial service using air or ground vehicles. We characterized transfers from NNC to NC for critically ill patients. *Methods:* A retrospective observational analysis was undertaken. The cohort included patients in Ontario with emergent and urgent neurologic pathologies who underwent transfer from a NNC to NC between January 1, 2011 and December 31, 2013. Timing, clinical, and geographic data were collected for each transfer. *Results:* We identified 1103 emergent/urgent transfers. The mean transfer time to a NC was 3.4hrs (SD = 3.0) and varied by the geographic region of origin. 17% of patients bypassed a closer NC during transfer to their destination NC. Transfers that bypassed a closer NC travelled further (162km vs. 477km, $p<0.001$), took longer (3.1hrs vs. 3.9hrs, $p<0.001$), and in some regions were associated with a higher risk of in-transit clinical decline (3.0% vs. 8.3%, $p<0.05$) when compared with transfers that ended at the closest NC. *Conclusions:* Transport time to a NC varied across Ontario. Transfers occasionally bypassed the nearest NC, which may reflect neurosurgical bed availability, resource limitations, or patient needs.

P.076

Use of drains versus no drains after burr-hole evacuation of chronic subdural hematoma

M Moores (Halifax)* L Fenerty (Halifax) G Thibault-Halman (Halifax) N Kureshi (Halifax) S Walling (Halifax) DB Clarke (Halifax)

doi: 10.1017/cjn.2015.185

Background: Chronic subdural hematomas (cSDH) are a common neurosurgical problem with significant morbidity and mortality. Current treatment methods are variable. Post-operative subdural drain used in conjunction with burr-hole craniostomy may reduce recurrence. This study compared recurrence rates for cSDH between two surgical practices with and without use of post-operative subdural drain at the QEII Health Sciences Center. *Methods:* A retrospective chart review was conducted to compare recurrence rates between surgical patients treated with or without a post-operative

drain between 1997-2012. The primary endpoint was recurrence, defined as occurrence of symptoms due to hematoma confirmed by CT within six months of the original operation. Categorical frequencies were compared with chi square or Fisher's exact test. Logistic regression was performed to identify risk factors for recurrence. *Results:* There were 85 patients (mean age 73 years; SD 13.0) who had burr-hole craniostomy. Age, cSDH volume, site, GCS, anticoagulation, drain, conservative treatment with steroids and perioperative steroids were not found to be independent predictors of recurrence. Recurrence occurred in 2 of 34 (5.9%) patients with drain, and in 7 of 51 (13.7%) without ($p=0.305$). There were insufficient data to compare mortality and complications. *Conclusions:* Use of post-operative subdural drain did not significantly alter the cSDH recurrence rate.

P.077

Factors associated with recurrence after endoscopic transphenoidal surgery for Cushing's disease

Y Meng (Toronto) S Suppiah (Toronto)* L Gonen (Toronto) G Klironomos (Toronto) F Gentili (Toronto) G Zadeh (Toronto)*

doi: 10.1017/cjn.2015.186

Introduction: Surgical removal is the standard treatment for Cushing's disease. Although endoscopic transsphenoidal surgical (ETS) approach has grown in popularity, its efficacy has not yet been established. Furthermore, achieving long-term remission remains challenging. *Methods:* We conducted a retrospective chart review of 39 consecutive patients who underwent ETS for Cushing's disease at our institution between 2005 and 2014. Univariate analysis using Pearson's χ^2 test was carried out on variables of patient demographics, radiology, pathology, biochemical markers versus recurrence. *Results:* The mean age was 40, with 82% females. Average length of follow-up was 44.8 months. Based on serum cortisol level, 28 patients (71%) achieved mid to long-term remission after ETS. Of them, 25 experienced an immediate remission, and 3 achieved a delayed remission as long as 4 months postoperatively. MRI findings of (1) microadenomas or no detectable abnormality, (2) adjacency to the cavernous sinus wall were associated with significantly higher recurrence rate ($p < 0.05$). Histologically, MIB-1 $>5\%$ was not a significant variable ($p = 0.55$). *Conclusion:* We found ETS resection to be an effective and safe procedure for majority of the ACTH-secreting adenomas, with remission rates $>70\%$. Additionally, patients with microadenomas, negative preoperative MR, and cavernous sinus adjacency were less likely to achieve remission.

P.078

Endoscopic third ventriculostomy (ETV) for treatment of adult hydrocephalus: long-term followup with 163 patients

A Isaacs (Calgary) G Urbaneja (Calgary) H Yong (Calgary) MG Hamilton (Calgary)*

doi: 10.1017/cjn.2015.187

Introduction: Treatment of specific patterns of symptomatic hydrocephalus in the adult patient may be accomplished with endoscopic third ventriculostomy (ETV) as an alternative to insertion of a ventriculoperitoneal (VP) shunt. This review examines a single center experience with ETV to treat hydrocephalus in symptomatic adult patients. *Methods:* Adult patients (≥ 18 years) with a diagnosis of

hydrocephalus who were treated with ETV in Calgary between January 1994 and July 2014 were reviewed using a clinic database and registry. *Results:* 163 patients were identified (male=92; female=71). Mean age at the time of ETV was 46.5 years (range 18-83.4 years). 118 underwent ETV as a primary treatment and 45 patients underwent treatment after presenting with VP shunt failure (secondary ETV). 113/163 patients had a diagnosis of aqueductal stenosis, 22/163 had a diagnosis of tumor. Mean followup was 8.2 years (range 0.3-18.4 years). Symptoms in 149/163 (91.4%) of ETV patients were better or unchanged at last followup. 104/118 (88.1%) of primary ETV patients were shunt free at last followup. 39/45 (86.7%) of secondary ETV patients were shunt free at last followup. *Conclusion:* Endoscopic (ETV) treatment is an effective long-term treatment for a select population of adult patients with hydrocephalus.

P.080

Classification of facial pain: a 13-year population-based study

L Barchet (Winnipeg) AM Kaufmann (Winnipeg)*

doi: 10.1017/cjn.2015.188

Introduction: Accurate diagnosis and classification of facial pain is critical for assigning surgical treatment, avoiding misdirected interventions and studying outcomes. We conducted a population-based longitudinal study of patients with facial pain and compared diagnostic classification systems. *Methods:* Medical records for all Manitobans presenting to our centre with a primary complaint of facial pain from 2001 to 2013 were reviewed. We then applied diagnostic criteria from the International Classification of Headache Disorders (IHS-3), the International Association for the Study of Pain (IASP) and Burchiel's system for comparisons. *Results:* There were 534 patients with facial pain (3.4/100,000/year) and two-thirds of these had conditions potentially amenable to neurosurgical interventions. Our most common diagnoses were *typical trigeminal neuralgia*(50%), *atypical trigeminal neuralgia*(7%), *idiopathic trigeminal neuropathy*(7%), *idiopathic facial pain*(11%); average ages were $65\pm 14(22-99)$, $60\pm 18(32-86)$, $55\pm 16(28-83)$ and $48\pm 12(28-82)$ with a female proportion of 55%, 59%, 65% and 80%, respectively. Other classification systems included no criteria for *idiopathic trigeminal neuropathy*. The classifications of "*trigeminal neuralgia type-1 and type-2*" did not differentiate between surgical and non-surgical candidates. *Conclusion:* Published classification systems of facial pain have differing criteria for diagnosis of trigeminal neuralgia and none defines a large group with *idiopathic trigeminal neuropathy*. This may lead to considerable variability in determinations of potential surgical candidates and comparing outcomes of treatment.