review potential research opportunities that nTMS provides. Details of Phase 2 clinical trial of nTMS for improving neuro-cognitive outcomes will be discussed. **Results:** Case ilustrations will be provided. Preliminary results of Phase 2 clinical study will be discussed. **Conclusions:** Navigated TMS provides another tool in the armamentarium of neurosurgeons to better manage and approach complex and eloquent lesions in the brain.

P.095

Novel use of fluorescein sodium in the resection of a pediatric posterior fossa tumor

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doi: 10.1017/cjn.2019.190

Background: Gross total resection of pediatric posterior fossa tumors is paramount towards improving progression-free survival.

Fluorescein accumulates in tumoral tissue, where the blood-brain barrier is disrupted. It can therefore potentially aid in differentiating tumoral versus normal tissue. We aimed to evaluate the efficacy of fluorescent-guidance (using fluorescein) towards the resection of a pediatric cerebellar tumor, as the index case at our institution using this technique. **Methods:** 5 mg/kg of IV fluorescein sodium was injected upon induction of general anesthesia. During tumor resection, a yellow 560-nm filter (Kinevo microscope, Zeiss) was employed for fluorescent-guidance. The extent of resection was assessed via post-operative MRI. **Results:** There were no adverse side effects experienced by the patient. Tumoral material was clearly visualized under the yellow 560-nm filter, allowing for satisfactory gross total resection of the lesion (confirmed on post-operative MRI). Preliminary pathology was consistent with medulloblastoma. **Conclusions:** Fluorescent-guided resection of pediatric posterior fossa tumors appears to be a safe and useful adjunct for gross total resection of these lesions. To the best of our knowledge, this is the first reported case in Canada wherein IV fluorescein was used under a yellow 560-nm filter for resection of a posterior fossa medulloblastoma in a child.

P.096

Practice patterns in the management of residual/recurrent non-functioning pituitary adenomas: results from a Canada-wide survey

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doi: 10.1017/cjn.2019.191

Background: Postoperative follow-up of non-functioning pituitary adenomas (NFAs) occasionally detects residual or recurrent disease. Subsequent treatment options range from continued follow-up, to re-resection or radiotherapy. To better understand current practice patterns on this topic, we surveyed neurosurgeons and radiation oncologists in Canada. **Methods:** Skull-base neurosurgeons and radiation oncologists across Canada were invited to complete a 25-item online questionnaire. Summary statistics were computed and 2-tailed t-tests were performed to assess significance. **Results:** 33 participants returned completed questionnaires: neurosurgeons (n=20, 61%) and radiation oncologists (ROs; n=13, 39%). When treating giant (>3cm) tumours, 92% of neurosurgeons in practice for less than 15 years use an endoscopic approach, as compared to only 57% of neurosurgeons in practice for 15 years or more. Additionally, younger neurosurgeons have a greater tendency to advocate for stereotactic radiosurgery (SRS) or re-resection (54% and 38%, respectively), as compared to older surgeons who show a higher propensity (29%) to advocate for observation. The presence of cavernous sinus extension appears to encourage neurosurgeons (40%) to offer radiotherapy sooner, as compared to 62% of ROs. **Conclusions:** Our results identify both variations and commonalities in practice amongst Canadian neurosurgeons. Approaches deviate in the setting of residual tumors based on years of practice.

P.097

Metabolomic and lipidomic profiling of high and low grade gliomas - a matched serum and tissue clinical study

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doi: 10.1017/cjn.2019.192

Background: It is well understood that gliomas require vast supply of energy to proliferate, invade and spread. We wished to identify novel biomarkers by comparing normal brain and plasma to high and low grade gliomas using newer techniques in laser ionization mass spectroscopy - precision metabolomics and lipidomics. **Methods:** Single center IRB approved tissue bank of "normal" brain and plasma (n=6) and IDH wild-type GBM tissue and plamsa (n=29), IDH mutant GBM tissue and plamsa (n=6), Low grade glioma (n=4) tissue and plamsa were analyzed for over 2000 endogenous metbolites and complex lipids. Unbiased clustering and Random Forest plots and pathway analysis were performed with appropriate statsitical analysis (significance $p < 0.05$). **Results:** IDH mutant GBM had higher levels of 2-HG, however, plasma 2-HG did not reflect IDH genotype. Changes in glucose and fatty acid utilization were observed in IDH WT and mutant gliomas compared to normal brain tissue. Lipidomics of plasma and tissue of normal and gliomas did not reveal a biomarker reaching statistical significance. **Conclusions:** We will continue to investigate if plasma and tissue biomarkers including hypotaurine, methionine, branched chain amino acid catabolites and pregnonolone can be used to predict tumor progression, response to treatment and clinical outcomes.

P.098

Novalis Certification of stereotactic radiosurgery programs: methodology and current status

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doi: 10.1017/cjn.2019.193

Background: The Novalis Certification Program is dedicated to providing a comprehensive and independent assessment of safety and quality in stereotactic radiosurgery (SRS). **Methods:** The program includes an independent review of SRS program structure, adequacy of personnel resources and training, appropriateness and use of technology, program quality management, patient-specific quality assurance and equipment quality control. Centres applying for Novalis Certification complete a self-study prior to a one-day visit by reviewers. Reviewers generate a descriptive 77-point report which is voted on by a multidisciplinary expert panel. Outcomes of reviews include mandatory requirements and optional recommendations, with the former requiring resolution prior to award of Certification. Sites undergo recertification every 4 years. **Results:** To date,

https://doi.org/10.1017/cjn.2019.193 Published online by Cambridge University Press

42 institutions have received Novalis Certification. A further 140 certification applications are pending. Two sites have been recertified, with 4 more in process this year. Analysis of review outcomes identified improved documentation of procedures as a frequent requirement, while frequent recommendations pertain to equipment/systems QA procedures and effective use of checklists/time outs. **Conclusions:** Novalis Certification is a unique, expanding peer review program assessing safety and quality in SRS and recognizing a high caliber of practice internationally. The standards-based approach highlights outstanding requirements and provides recommendations to enhance both new and established programs.

P.099

Integrating DNA methylation profiling in brain tumour diagnosis directly changes patient oncological care

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doi: 10.1017/cjn.2019.194

Background: Molecular signatures are being increasing used to classify central nervous system (CNS) tumors with incorporation into World Health Organization (WHO) classifications. A recently published genome-wide DNA methylation-based CNS tumor classifier assisted in diagnostically challenging cases. However its impact on patient care has not been reported, limiting translation to other centres. **Methods:** All 55 challenging CNS tumour diagnoses over three years underwent DNA methylation profiling. Tumor classification along with copy number variant (CNV) plot results were integrated with histopathological findings to determine final diagnoses and corresponding clinical impact was assessed. **Results:** After methylation profiling 46/55 (84%) received clinically relevant diagnostic changes, 30 (55%) with a new diagnosis or resolved differential diagnosis and 16 (29%) with clinically important molecular diagnostic or subtyping changes. WHO grade changed in 15 (27%), with two-thirds upgraded. Nine new IDH mutations in gliomas, four new molecular subtypes in medulloblastomas/ependymomas, and three false positive 1p/19q codeletions were identified. Patient care was directly changed by methylation profiling in 7/47 (15%) followed-up cases to avoid unnecessary treatment in three, insufficient treatment in three, and medically assisted death in one. **Conclusions:** This real-world use of methylation-based CNS tumor classification substantially impacts patient care for diagnostically challenging tumors and also avoids misdiagnosis-related uncessary resource use.

P.101

Conservative management of meningiomas with a moderate to high peritumoral brain edema index: a single-institution report

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doi: 10.1017/cjn.2019.195

Background: Meningiomas are the most commonly occurring benign intracranial tumors. When presenting with peritumoral brain edema (PTBE), surgical treatment can lead to patient morbidity. This retrospective case series aims to describe the conservative medical management of moderate to large meningiomas with large PTBE. **Methods:** Patients with suspected meningiomas greater than 2.0cm and edema index greater than 2.0 were identified by screening 3345 MRI scans between 2012-2017. Imaging analysis included MR imaging features of suspected meningiomas and clinical data was gathered from the electronic patient record (patient age, sex, patient symptoms, follow-up duration, and follow-up symptoms). **Results:** We report on 31 patients who received conservative medical management. Presenting complaints included headache, seizure, weakness; many presented asymptomatically. The average follow-up time was 3.96 years. At the final follow-up appointment, 19 (61%) patients were asymptomatic. Among symptomatic patients, seizures were the most common complaint. There was no mortality reported in our cohort and the average tumor progression was 7.04cm^3/year. **Conclusions:** In this retrospective report of meningioma patients with high edema index, we found that most patients remained asymptomatic or had stable symptoms after at least 1-yr follow up after medical treatment. This study provides insight around the surgical decision-making for meningiomas with large spread of edema.

P.102

Expanded endoscopic endonasal approach for orbital apex decompression

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doi: 10.1017/cjn.2019.196

Background: The Endoscopic endonasal approach (EEA) has been gaining popularity in the past decade as an alternative to traditional transcranial and transorbital approaches. We have performed orbital apex decompression for a variety of pathological entities. **Methods:** We performed a retrospective chart review on patients who underwent EEA orbital apex decompression between January 1st 2010 and December 1st 2018 at McMaster University. **Results:** Eight patients underwent endoscopic endonasal orbital decompression at our center, including five male patients and three female patients. The mean age of our patients was 50.1 years. The different pathologies we treated included nasopharyngeal carcinoma, hemangioma, fibrous dysplasia, IgG4 disease, inverted papilloma, angioleiomyoma, and neuroendocrine paraganglioma. Five patients presented with visual symptoms. Postoperatively, one of these five patients improved to baseline, three had stable vision, another one had progressive visual decline despite surgical intervention. **Conclusions:** Endoscopic endonasal approach can be used as an alternative to decompress orbital apex pathologies in selected patients.

https://doi.org/10.1017/cjn.2019.193 Published online by Cambridge University Press