manipulation) with Excalibur and two commercially available handcontrollers (Sigma 7 and PHANToM Premium 3.0). A modified Kuka endeffector with bipolar forceps, and Leica microscope completed the remote robotic site. Comparisons were made based on training time, task completion time and number of errors. All participants completed a questionnaire. **Results:** Repeated measures ANOVA demonstrated significance for task completion time (p=0.004), training time (p=0.021) and number of errors (p=0.004). Surgeons were faster with Excalibur (72s) than with Sigma (96s,p=0.005) and PHANToM (96s,p=0.036). Training time was shorter with Excalibur than with PHANToM (210s vs 310s,p=0.013), and users made fewer errors (0.7 vs 2.1,p=0.008). Training time required for Sigma (285s) and the number of errors (1.3) were not significant. The surgeons found Excalibur smoother, more comfortable, less tiring and easier to maneuver, with more realistic force feedback and superior movement fidelity. **Conclusions:** Surgical performance was superior with Excalibur compared to the other handcontrollers. This may reflect the microsurgical requirements and unique design architecture of Excalibur.

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Impact of postoperative discharge destination on length of stay

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Background: The aim of this study is to assess factors impacting the postoperative length of stay (LOS) for patients undergoing microvascular decompression (MVD) surgery. **Methods:** A consecutive series of patients undergoing MVD at the Winnipeg Centre for Cranial Nerve Disorders were reviewed. All patients were monitored in a neurosurgical stepdown unit for at least 6 hours postoperatively and when medically stable discharged at their own discretion. The hospital LOS was measured in hours from midnight after day of surgery and categorized by days in hospital. **Results:** The 112 patients included 53 Manitobans (MB) and 59 from out of province (OOP). The overall LOS was 38±52 hours, and not significantly different between genders, diagnosis or age. LOS was significantly shorter for OOP versus MB patients (28±23/48±71 hours; p=0.02). OOP patients were also more often discharged on the first postoperative day (59% versus 32%; p=0.02) and 85% of them stayed at the hotel within the hospital complex prior to travelling home. **Conclusions:** Postoperative discharge to an adjacent hotel appears to have led to shorter LOS. These patients may have been reassured by the physical proximity to medical care. The utilization of discharge to an adjacent hotel or comparable faculty may reduce hospitalization days and associated costs.

P.120

Rapid intraoperative reconstruction of cranial implants for craniotomy procedures: a feasibility study

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Background: The aim of this study was to investigate intraoperative methods to generate patient-specific PMMA bone implants during a craniotomy. The proposed methods combine a cost-efficient, and non-invasive structured light scanner (SLS) as an imaging modality and a prototype printer for rapid generation of implant molds. **Methods:** This simulation study was performed using retrospective data from three craniotomy patients. The extracted bone flap and the cranial defect were scanned using a SLS, which generates a 3D surface model of an object by projecting a series of light-patterns on it. Prototype printed implant models were generated using two different techniques. The molds were then used to shape PMMA bone implants. These implants were evaluated regarding their accuracy to reconstruct the natural skull anatomy and compared to freehand formed implants. **Results:** The patient-specific bone implants reconstructed the preoperative anatomy with an average RMS error of 1.37mm (StDev 0.27), compared to an error of 1.5mm (StDev 0.43) for the freehand shaped implants. On average the intraoperative scanning time was 4.7min. The average time to generate and print the implant molds was 204 min. **Conclusions:** Results of this study have shown great promise for the proposed method to be used for patient-specific bone flap reconstruction during craniotomies.

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The prediction of outcome after shunting for idiopathic normal pressure hydrocephalus

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Background: Idiopathic normal pressure hydrocephalus (iNPH) is a triad of impaired gait, cognition and urinary control in the setting of normal pressure ventriculomegaly. Various options for shunt implantation exist, but there is limited ability to predict outcome. **Methods:** This study is a retrospective chart review of 82 shunted patients for iNPH between 2007 and 2018. Factors examined included age, sex, lumbar puncture results, use of laparoscopic approach, type of shunt used, Charlson Comorbidity Index and imaging (callosal angle and DESH). Patient outcome was assessed via modified Rankin Scale (mRS). **Results:** 52 patients were male and 30 were female. Average age at surgery was 71.4 years. 58/62 (94%) improved following lumbar puncture. 41% of patients had VP shunt, and 59% of patients had LP shunt. 30/79 (38%) had laparoscopic placement of the distal catheter. 23/75 (31%) and 30/81 (36%) had a complication and required reoperation, respectively. Callosal angle showed statistically significant increase post-shunting (76 to 94 degrees, p<0.005). Presence of DESH did not change post-shunting. Average Charlson Comorbidity Index was 4.4. The mRS decreased from 3.84 to 2.66 postoperatively (p<0.005). **Conclusions:** In our centre, iNPH patients had clinicoradiologic improvement following shunting. We will perform regressional statistics to elucidate the factors influencing outcomes.

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Normal pressure hydrocephalus with associated tremor

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Background: Normal pressure hydrocephalus is a frequent cause of cognitive and functional impairment. Many symptoms are shared between Parkinson's disease and normal pressure hydrocephalus. Only few studies examine extrapyramidal signs in NPH, and only one case report exists describing tremor improvement with shunting. **Methods:** We performed a retrospective chart review of our