INTRODUCTION: For the treatment of unruptured cerebral aneurysms, the determinants of extended length of stay are relatively unknown.

METHODS: The National Inpatient Sample years 2010–2014 was queried. Adults with unruptured aneurysm undergoing either clipping or coiling were selected using the ICD-9-CM coding system. Extended LOS was defined as greater than 75th percentile for the entire cohort (>5 days). Weighted patient demographics, comorbidities, complications, LOS, disposition and total cost were recorded. Multivariate logistic regression was used to determine the odds ratio for risk-adjusted extended LOS. The primary outcome was the degree patient comorbidities or postoperative complications correlated with extended LOS.

RESULTS: A total of 46,880 patients were identified for which 9,774 (20.8%) patients had extended LOS (Normal LOS: 37,106; Extended LOS: 9,774). Patients in the extended LOS cohort presented with a greater number of comorbidities compared to the normal LOS cohort. A greater proportion of the normal LOS cohort was coiled (Normal LOS: 37.0% vs. Extended LOS: 66.5%, P < .001). The overall complication rates were greater in the extended LOS cohort (Normal LOS: 7.3% vs. Extended LOS: 43.8%, P < .001). On average, the extended LOS cohort incurred a total cost nearly twice as large (Normal LOS: $26,050 ± 13,430 vs. Extended LOS: $52,195 ± 37,252, P < .001) and had more patients encounter non-routine discharges (Normal LOS: 8.5% vs. Extended LOS: 52.5%, P < .001) compared to the normal LOS cohort. On weighted multivariate logistic regression, multiple patient-specific factors were associated with extended LOS. These included demographics, preadmission comorbidities, choice of procedure, and inpatient complications. The odds ratio for extended LOS was 5.14 (95% CI, 4.30 – 6.14) for patients with 1 complication and 19.58 (95% CI, 15.75 - 24.34) for patients with > 1 complication.

CONCLUSION: Our study demonstrates that extended length of stay after treatment of unruptured aneurysms is influenced by a number of modifiable patient-specific factors, including both pre- and perioperative variables.

148 Analysis of Payments to Spine Surgeons Using the Open Payments Database

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INTRODUCTION: Since the 2013 Physician Payments Sunshine Act, all payments to physicians from drug and device manufacturers greater than $10 are required to be publicly disclosed. A record of these payments is publicly accessible through the Open Payments Database (OPD), an online searchable database.

METHODS: Payments to academic spine surgeons in 2018 were queried through the OPD. Academic spine surgeons practicing at institutions in Chicago, Los Angeles, New York, Philadelphia, and Houston with both orthopedic and neurosurgical residency programs were included. If 2018 information was not available, the most recent year was used instead. All payments were recorded and combined to create the total reported payment. Number of publications for each academic spine surgeon for 2018 was taken from PubMed.

RESULTS: One hundred and thirty-eight academic spine surgeons were included in analysis including seventy neurosurgeons and sixty-eight orthopedic surgeons. The average total reported payments for all surgeons was $172,366 ± 778,701 (Range $12,782,343). The average number of publications in 2018 was 5.39 ± 7.98 (Range 0–46). The average in total reported payments to orthopedic spine surgeons ($311,035 ± 1,093,359) was significantly higher than the average in total reported payments to neurosurgery spine surgeons ($37,659 ± 76,289) (P = .044). The averages in total general payments and consulting fees were also significantly higher to orthopedic spine surgeons. The average number of publications in 2018 was higher from orthopedic spine surgeons (6.00 ± 8.47) compared to neurosurgeons (4.79 ± 7.48) but not statistically significant(P = .385). There were no linear relationships between payment amounts in any category (including royalty or license, consulting, or honoraria) and number of publications. Average payments to academic spine surgeons on the West Coast, East Coast, or Midwest were not significantly different(P = .34).

CONCLUSION: This is the first study to examine payments to spine surgeons using OPD data. This study shows that in 2018, orthopedic spine surgeons received significantly higher industry contributions than neurosurgery spine surgeons. There was no significant correlation between industry payments and research publications. There was no significant difference in industry payments across different regions of the country.

149 Demands for Essential Neurosurgical Care During the COVID-19 Pandemic: A Single Center Cross-sectional Report

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INTRODUCTION: The COVID-19 pandemic has caused unprecedented social, geopolitical, and health systems factors that may affect types of patients presenting for essential, non-ambulatory care. Social distancing and lockdowns may reduce the incidence of trauma; however, a significant decline in presentations of acute medical conditions such as stroke and ACS have been reported. Furthermore, health system capacities are substantially altered, with elective surgeries postponed to devote resources to COVID-related illness and high acuity non-COVID illness.

METHODS: We reviewed all emergency department and inpatient consultations to the neurosurgical service at a Level 1 Trauma Center during an 8-week post-lockdown period (3/15-5/4), quantifying overall volume, as well the distribution of problem types and management endpoints.

RESULTS: Pandemic period consult volumes were significantly lower than those of parallel periods in 2016–2019 (388 vs. a 4-year average of
576, \( P < .001 \), Pearson’s chi-squared text). Compared to 2016–2019, 2020 consult volume was decreased by 37% during the first four weeks following lockdown (204 vs. 280, \( P = .01 \)), and by 48% during the latter four weeks (184 vs. 296, \( P < .001 \)). Pandemic period consults required acute surgery in 21% of cases, non-acute or non-surgical management in 75%, and palliative management (CMO, hospice, death) in 4%. During the prior year (2019), these proportions were 15%, 80% and 5%, respectively (\( P = .06 \)). The distribution of consult problem types was not statistically different between periods. Among cranial consults, trauma comprised 45% during the pandemic compared to 41% in the analogous 2019 period; tumor 20% vs 18%; vascular 16%; and ICH/stroke 8%. Among spinal consults, trauma comprised 47% vs 43%, tumor 6% vs 3%, and degenerative disc disease 29% vs 36%.

CONCLUSION: Neurosurgical consult volume increasingly declined throughout the post-lockdown COVID-19 pandemic period, which was unprecedented over the 5 years studied. A higher proportion of consults resulted in acute care surgery, approaching statistical significance. Surprisingly, problem types did not differ in the pandemic period despite vastly different social circumstances. Further study will employ time series analysis to contextualize these changes within local COVID-19 surge data.

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The Effect of Socioeconomic Status on Morbidity and Mortality Following Supratentorial Meningioma Resection

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INTRODUCTION: Household income is a known social determinant of health that has been associated with discrepancies in neurological outcome. However, the role of income following supratentorial meningioma resection, which has a favorable prognosis and low rate of complication, has not been well described.

METHODS: 351 consecutive patients undergoing supratentorial meningioma tumor resection, at a single health system over a six-year period (June 2013 – April 2019) were analyzed retrospectively. Patient characteristics were obtained from the electronic medical record, including MHI, history of prior surgery, smoking status, American Society of Anesthesiologists (ASA) grade, and Charlson Comorbidity Index (CCI), amongst others. Outcomes assessed include readmission, emergency department (ED) evaluation, unplanned reoperation, unplanned return to surgery after index admission, and mortality within 30 and 90 days. Unplanned return to surgery and mortality throughout the entire follow-up period were also assessed. Univariate regression analysis was conducted across the entire population and between the lowest (Q1) and highest (Q4) socioeconomic quartiles, with significance set at \( p < 0.05 \). Stepwise regression was performed to identify confounding variables.

RESULTS: In the whole population, MHI significantly predicted ED evaluation within 30 days \( (P < .01, OR = 2.00, 95\% CI = 1.28-3.13) \) and 90 days \( (P < .01, OR = 1.92, 95\% CI = 1.30-3.13) \) of supratentorial meningioma resection. Between Q1 (MHI ≤ $51,780) and Q4 (MHI ≥ $87,958), similar results were noted with a significant increase in 30-day ED evaluation \( (P = .03, OR = 3.57, 95\% CI = 1.11-11.11) \) and 90-day ED evaluation \( (P = .02, OR = 2.86, 95\% CI = 1.1-7.14) \) for patients of reduced household income. No significant difference was noted for other metrics of morbidity and mortality at 30-days, 90-days and throughout the entire follow-up period in both whole population and Q1 vs. Q4 analysis \( (P = .20-.74) \).

CONCLUSION: This study demonstrates that socioeconomic background can affect patient outcome following supratentorial meningioma resection. Increased emergency room utilization following surgery by patients of lower household income indicates the potential to identify interventions to improve patient care in vulnerable populations. Given that supratentorial meningiomas account for over half of non-malignant primary brain tumors, such improvements are necessary to reduce avoidable healthcare costs, improve quality of care, and provide equitable treatment.

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Telemedicine in Neurosurgery: Lessons Learned and Transformation of Care During COVID-19

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INTRODUCTION: The COVID-19 national emergency declared in the United States on March 13th, 2020 dramatically changed the role of telemedicine in clinical care since shelter-in-place orders were issued throughout the country. In an effort to limit the patient and healthcare provider exposure, telemedicine has been an essential platform. As neurosurgical providers interact with patients in the operating room, intensive care unit, emergency department, and outpatient clinics each day, they place themselves as well as their patients at an increased risk of exposure. There is a widespread need for further implementation of telemedicine to reduce viral exposure.

METHODS: A single-center retrospective cohort study of patients who received neurosurgical care at a single-center tertiary academic center from February to April 2020 was conducted. Patients evaluated from March to April 2019 were included for comparison. A total of 10,746 patients were included: 1247 patients underwent surgery, 8,742 were seen in clinic via an in-person outpatient visit and 757 were assessed via telemedicine during the study period.

RESULTS: A 36-fold increase in the use of telemedicine was noted after the shelter-in-place measures were initiated with a significant increase in the mean number of patients evaluated via telemedicine per week across all divisions of neurosurgery \( (3.9 ± 3.0 to 141.4 ± 19.8, P < .001) \). The majority of telemedicine appointments were established patient visits (61.2%), but the proportion of new patient visits also significantly increased to an average of 8.2 ± 5.3 per week across all divisions during the pandemic.

CONCLUSION: Experience with telemedicine prior to the COVID-19 pandemic allowed for rapid expansion of our program to meet the needs of our patients once the shelter-in-place measures were ordered. We provide a detailed account of the lessons learned and discuss the anticipated role of telemedicine in surgical practices once the shelter-in-place measures are lifted.