ABSTRACT:
Introduction: The purpose of this study is to evaluate the direct costs of neurosurgery and to promote an increase in cost savings across multiple procedure types. At the University of Utah, the Value Driven Outcomes (VDO) database is a unique tool used to evaluate direct healthcare costs. While treatment costs for a variety of individual neurosurgical diseases have previously been performed, a cross-comparison of costs based on procedural type has yet to be fully investigated.

Methods: Patients included in the study involved elective surgeries between July 2011 through February 2018. The VDO database was queried to evaluate costs for procedures involving the following neurosurgical diseases: vestibular schwannomas, pituitary adenomas, meningiomas, gliomas, aneurysms, 1- and 2-level lumbar fusions, and 1- to 3-level anterior cervical discectomy and fusion (ACDF).

Results: A total of 1997 patients (mean age 54.6 ± 14.5 years, 45.2% male) were analyzed. The distribution of total cost involved facility utilization (48.4%), supplies and implants (35.8%), pharmacy (9.1%), imaging (3.5%), and laboratory services (3.1%). A mean length of stay of 4.0±4.4 days was seen across all procedure types, with ACDFs (1.5±1.2 days) being the shortest and glioma resection (5.6±5.6 days) being the longest. A multivariate linear regression showed a significant positive correlation between length of stay and total cost (β=0.660, p<0.001). For cases involving hardware placement (spine and vascular subgroups), the principle variables impacting total cost included supplies and implants. In cases involving tumor resection subgroups (vestibular schwannomas, pituitary adenomas, meningiomas, and gliomas), facility utilization was the largest contributing factor. For each individual subgroup, less than 20% of the total cost was comprised of laboratory, imaging, and pharmacy costs.

Conclusion: The VDO database is a novel tool used to evaluate the direct costs, not charges, of healthcare delivery. The results of this cross-comparison study involving multiple neurosurgical diseases suggests that various approaches must be taken to mitigate costs according to procedure type. Based on this cohort, the greatest potential effect on neurosurgical cost containment may be achieved by a reduction in facility utilization costs, followed by supply and implant costs.