METHODS: Collected data included age, sex, race (white vs non-white), neighborhood socioeconomic status (nSES, low vs high), insurance status, Charlson Comorbidity Index (CCI), histologic diagnosis, tumor stage at presentation, and treatment at a National Cancer Institute designated Cancer Center (NCICC). Univariate and multivariate analyses were performed to identify predictors of survival and receipt of standard treatment for each histologic type.

RESULTS: Four hundred eighty-four patients met inclusion criteria. The cohort was mixed: >20 years old (80%), “white” (64%); “low nSES” (56%); private insurance (36%), Medicare/public insurance (16%), Medicare (15%), uninsured/self-pay (6.4%). Chordoma (37%) was most common, while osteosarcoma was least common (16%). Ewing sarcoma and chondrosarcoma each accounted for 24% of the cohort. Locally advanced disease (40%) and localized disease (34%) were most common. Metastatic disease was uncommon (16%). The minority (29%) received treatment at a NCICC. Mortality was 58%. There were significant differences in receipt of “standard” treatment based on histology: chondrosarcoma (47%), chordoma (28%), Ewing’s sarcoma (24%), osteosarcoma (21%) (p<0.0001). Patients with private insurance were most likely to receive “standard” treatment. Race and nSES were not associated with receipt of “standard” treatment for each histology, but being seen at an NCICC was (p=0.0006). In regard to survival, age>20, higher CCI, Medicare/Medicaid insurance, more extensive stage of disease, and receiving no known treatment (compared to the “standard” treatment) were associated with lower odds of survival (all p<0.05).

CONCLUSIONS: Over a 28-year timeframe, the majority of patients with a primary osseous sarcoma of the mobile spine in the California Cancer Registry neither received “standard” treatment nor were cared for at an NCI cancer center. Mortality within 1 year was 58%. That survival was jeopardized by having public insurance and more extensive stage of disease and that survival was improved by receipt of “standard” treatment suggest that efforts should aim to improve access to designated cancer institutes and “standard” treatment paradigms to improve outcomes and survival for patients with malignant tumors of the mobile spine.

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P77. Optimizing the spine surgery instrument trays to immediately increase efficiency and lower costs in the operating room
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BACKGROUND CONTEXT: Spine surgery is increasingly scrutinized in a climate of rising health care costs given its cost per procedure compared to other specialties. Fortunately, there are many sources of inefficiency that can be addressed without compromising patient care. Surgical trays are often poorly configured and have considerable economic implications as they comprise a large portion of perioperative budgets. Instruments are typically added on an ad-hoc basis, based on surgeon request, which can result in excessively large and inefficient trays. A solution must take into account the conflicting issues of clinical need, costs, ease of batching, prevention of adverse clinical events, and minimization of wear-and-tear on instruments. Clinician review and cost-analysis of surgical trays are two methods historically used to address this challenge, although they have shortcomings. We conducted an interventional quality improvement study to determine if a customized mathematical inventory optimization model would result in greater reduction of instruments than a clinician review.

METHODS: This was a single-site quality improvement study conducted at a large academic hospital which performs over 750 laminectomy procedures annually. Two trays are required: 1) Laminectomy Tray (LT) and 2) Basic Neurosurgery Tray (BNT). As such, the focus of our study was to optimize these two trays. A trained observer was present in the operating room (OR) during 25 randomly selected laminectomy procedures. Processes in the MDRD and OR were observed to comprehensively quantify associated costs. The results of the observations were applied to a mathematical model to determine ideal tray configuration. In addition, a clinician review (CR) of the trays was performed for comparison.

RESULTS: The mathematical model produced an ideal tray size of 29 for the LT, representing a reduction of 41% from the original size of 49. For the BNT, the mathematical model produced an ideal tray size of 23 instruments, a reduction of 50% instruments from the original size of 46. Combined, this represented $20,934 in annual savings. In contrast, CR alone suggested an ideal tray size of 35 (29% reduction) for the LT and 37 (19%) for the BNT, and instruments, and $11,197 in annual savings.

CONCLUSIONS: Superior reduction of surgical trays used for laminectomy was achieved using a mathematical model when compared to CR alone. The mathematical model yielded an additional 10% instrument reduction and $9,737 in savings compared to clinician review alone. Our model comprehensively optimizes the surgical trays by incorporating several cost drivers important to major processes involved in surgical tray assembly, processing and OR utilization. This model may be generalizable to all specialties and hospitals to determine optimal tray configuration. The financial implications are broad; at our institution, application of the mathematical model to all surgical trays would result in projected costs savings of $312,476 annually. Surgeons and managers looking to manage costs should consider this evidence-based approach.

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