

Social Determinants of Health Predict Early Postoperative Outcomes Following Decompression or Single-level Fusion for Degenerative Spondylolisthesis

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INTRODUCTION: Hospital length of stay (LOS), discharge disposition, and 30-day complications are distinct but highly interrelated outcomes that correspond to key inflection points along a patient's postoperative recovery. Understanding factors that may be influential at each of these points is important for risk stratification, informing patient and provider expectations, and multidisciplinary care coordination that best meets each patient's unique discharge needs. Recent literature has demonstrated that socioeconomic and environmental factors, collectively termed social determinants of health (SDOH), may play a significant role in predicting patient outcomes. A more thorough investigation of how these factors influence different outcomes in spine surgery is warranted.

METHODS: We retrospectively reviewed the medical records of consecutive patients treated for L4/5 degenerative spondylolisthesis between January 2016 and January 2021. Information regarding patient demographics, SDOH, baseline health status and health-related behaviors, and surgical factors were collected and analyzed. Patient age, gender, race, ethnicity, preferred language, marital status, religious belief, insurance type, and employment status were extracted from the medical record. Zip codes were used to obtain additional neighborhood-level data including Area Deprivation Index (ADI), community walkability, distance to transit stop, and geographic region of the San Francisco Bay Area. Median income was estimated using 2019 American Community Survey data. Multivariate analysis was performed to identify predictors of LOS, discharge disposition, and 30-day readmission and reoperation.

RESULTS: A total of 298 patients were included (56.3% female, mean age 68.1 years). Mean LOS was 3.5 ± 1.8 days. More resource intensive dispositions were associated with longer LOS. Independent predictors of LOS included employment status, comorbidity burden, and the treating surgical specialty. Most (82.2%) patients were discharged home (44.6%) or home with services (37.5%), with a minority (17.8%) to an acute rehab (8.1%) or subacute nursing facility (9.7%). Those discharged home had a shorter LOS (3.1 vs 5.4 days, $p < 0.001$). These patients were significantly younger (67.2 vs 71.6 years) and more frequently identified as white (79.1% vs 62.2%, $p = 0.008$), primarily English-speaking (97.1% vs 88.6%, $p = 0.005$), married or partnered (75.5% vs 41.5%, $p < 0.001$), employed (35.9% vs 15.1%, $p = 0.005$), and current alcohol users (66.5% vs 41.5%, $p < 0.001$). Unemployment (OR 3.84, 95% CI 1.04 – 14.86, $p = 0.044$), a not-partnered marital status (OR 4.38, 95% CI 1.95 – 10.26, $p < 0.001$), and higher BMI (OR 1.09 per unit increase, 95% CI 1.02 – 1.18, $p = 0.014$) all independently predicted a non-home discharge. Early complication rates were extremely low and included 10 readmissions and 7 reoperations in 12 patients. Male sex, a not-partnered marital status, and psychiatric comorbidities were associated with early complications.

DISCUSSION: We identified various sociodemographic, medical, and surgical factors that may influence LOS, discharge disposition, and early complications following elective spine surgery. Routine screening with attention to these factors can facilitate an expedited, appropriate patient disposition postoperatively that avoids unnecessary medical risks and costs associated. Further study will be necessary to better understand these relationships and to determine optimal clinical pathways.

SIGNIFICANCE/CLINICAL RELEVANCE: Social Determinants of Health can have a significant impact on patients' medical decision-making, access to healthcare, and overall quality of life. A more comprehensive understanding of how these factors contribute to outcomes in spine surgery can help identify opportunities to prevent complications, address healthcare inequities, and provide more personalized, cost-effective patient care.