

Disparities in Postoperative Complications and Perioperative Events based on Insurance Status following Elective Spine Surgery: A Systematic Review and Meta-Analysis

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INTRODUCTION: As the number of Americans with government insurance rapidly increases, the expanding disparity between the care of privately and government insured patients is an increasing concern. Increasing evidence demonstrates disparities among patients with differing insurance statuses in the field of spine surgery. However, no pooled analyses have performed a robust review characterizing differences in postoperative outcomes among patients with varying insurance types. The purpose of our review is to use a semi-automated AI-assisted review platform to broadly assess the effects of insurance status on perioperative events and postoperative complications following elective spine surgery.

METHODS: A comprehensive literature search of PUBMED, MEDLINE(R), ERIC, and EMBASE was performed using a semi-automated cloud-based platform for systematic reviews and meta-analyses to identify works that compared the postoperative outcomes of patients with private vs. government insurance. Pooled incidence rates and odds ratios were calculated for each outcome, and meta-analyses were conducted for three perioperative events and two types of postoperative complications. A total of 25 meta-analyses were performed for the following outcomes: 90-day readmission, non-routine discharge (NRD), extended length of stay (LOS), any complication, and all medical complications. For each of these five outcomes, meta-analyses of the following comparisons were performed: 1) private insurance vs. government insurance, which includes a pooled analysis of multiple types of government insurance (Medicaid, Medicare, Veterans Affairs, Managed Care, and Triwest); 2) subanalysis comparing Medicaid to private insurance; 3) subanalysis comparing Medicare to private insurance; 4) Medicare versus Medicaid; and 5) Medicare versus non-Medicare, which includes a pooled analysis of values reported for Private Insurance, Government Insurance, Medicaid, Veterans Affairs, Managed Care, and Triwest (Table).

RESULTS: Thirty-eight studies (5,018,165 total patients) were included. Compared with patients who had private insurance, patients with government insurance had an increased incidence of 90-day readmissions (OR 1.84, $p < 0.0001$) (Figure 1), NRD (OR 4.40, $p < 0.0001$) (Figure 2), extended LOS (OR 1.82, $p < 0.0001$), postoperative complication (OR 1.61, $p < 0.0001$), and any medical complication (OR 1.93, $p < 0.0001$) (Figure 3). These differences persisted across outcomes in subanalyses comparing Medicare or Medicaid to private insurance. Similarly, across all examined outcomes, Medicare patients had a higher risk of experiencing an adverse event compared to non-Medicare patients (Figures 4-6). Compared to Medicaid patients, Medicare patients were only more likely to experience NRD (OR 2.68, $p = 0.0007$).

DISCUSSION AND CONCLUSION: Patients with government insurance have a greater likelihood of morbidity across several perioperative outcomes. Additionally, Medicare patients fare worse than non-Medicare patients across outcomes, potentially due to age-based discrimination. Based on these results, it is clear that directed measures should be taken to ensure that underinsured patients receive equal access to resources and quality care.

