DOI: https://dx.doi.org/10.18203/issn.2455-4510.IntJResOrthop20254207

Original Research Article

Impact of the COVID-19 pandemic on prior authorization delays for lumbar surgery: a retrospective cohort study

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Received: 18 October 2025
Revised: 03 December 2025
Accepted: 19 December 2025

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ABSTRACT

Background: The objective of this study was to evaluate the impact of the COVID-19 pandemic on prior authorization (PA) delays for lumbar surgery and to assess whether these changes varied by insurance type and patient demographics.
Methods: A retrospective cohort study comparing lumbar surgery patients treated before the COVID-19 pandemic (2017-2018) and after the pandemic (2022–2023). We reviewed 400 patient charts from Alpine Ortho spine clinic database in Eastern Washington, of which 363 met inclusion criteria. Eligible patients had documentation of preoperative clinic visit, PA request, and lumbar surgery as defined by CPT codes. Demographics, comorbidities, payer type, and surgical details were extracted from electronic medical records. For Medicare patients, who do not require PA, the interval from preoperative clinic visit to surgery was used for consistency. The primary outcome was time from PA request to surgery. Statistical analysis was performed using two-way ANOVA with Tukey's HSD for post-hoc comparisons.
Results: The mean PA interval increased from 38.7±14.2 days in 2017-2018 to 60.4±15.8 days in 2022-2023 ($p< 0.001$). Female patients in 2022-2023 experienced longer delays (62.0 ± 15.1 days) than males (58.5±16.3 days, $p=0.03$). Across payer types, Medicaid patients waited the longest. In 2022-2023, Medicaid patients waited 66.7±15.6 days, Private patients 53.9±14.9 days, and Medicare patients 61.5±15.2 days.
Conclusions: PA delays for lumbar surgery significantly worsened following COVID-19, with disproportionate impacts on Medicaid and Medicare patients.

Keywords: Lumbar degenerative disease, Lumbar surgery, Prior authorization, Surgical wait times, Insurance type, Retrospective cohort

INTRODUCTION

Lumbar degenerative pathology is a common and wearing ailment, resulting in patient pain and disability. The prevalence of low-back pain due to degenerative lumbar disease is estimated to be 4.5% in North American and 3.6% worldwide.[1] Eighty-three million years adjusted for quality were lost to disability and low-back pain in 2010.[2] Hence, as the age of the population increases, so will both diagnosis and treatment of degenerative lumbar disease resulting in an increase in both burden and cost. Likewise, there has been a steady increase in the lumbar surgery rates over time as well.[3] This is in part due to the fact that an evident benefit of lumbar fusion/surgery has been seen in many patients indicated by lower pain and disability scores and the ability to return to work.[4] Thus, in patients with lumbar degenerative disease it is imperative to learn the time between the pre-authorization (PA) and definitive surgical treatment. Increased surgical wait times and PA approval can be influenced by numerous factors such as preoperative planning, medical clearance, patient

preferences and structural problems within the US healthcare system.[5]

In recent decades, there has been a significant change in the US healthcare system, with a intended shift towards value-based care models that prioritize enhancing quality while reducing perceived unnecessary resource expenditure. As part of this endeavor, PA emerged as one of the initial strategies implemented to support this goal.[6-8] The implementation of prior authorization review (PAR) in the United States aimed to reduce the occurrence of unnecessary medical interventions and mitigate excessive variability in healthcare delivery, focused primarily on primary care.[9]

However, over the years, payors in the United States have expanded the application of PAR, extending its scope to include imaging studies, prescriptions, and routine treatments.[10-11] Due to the critical role of advanced imaging and surgical procedures in the orthopaedic specialty, orthopaedic surgery bears a disproportionately greater responsibility in obtaining prior authorization as a routine aspect of patient care.[6,11] In recent times, doubts have been raised regarding the efficacy of PA review PA within the US healthcare system, primarily due to the scarcity of data supporting its utility.[6,7,12] According to a report by the US Department of Health and Human Services, PAR denies appropriate medical care around 20% of the time, resulting in delays or prevention of necessary medical interventions.[13] Research in dermatology and urology indicates that implementing PA may escalate administrative workload, introduce supplementary expenses, and prolong access times without enhancing healthcare quality.[10,14,15]

The goal of this study is to define the increase in PA time for orthopaedic surgery specifically in the subspecialty of lumbar surgery from 2017-2018 to 2022-2023. A secondary aim is to conduct a detailed subgroup analysis to determine whether the change in wait times is consistent across different insurance types and key patient demographics. These year groupings were taken categorically to mitigate the acute effect of insurance staffing issues that arose during the initial phase of the COVID-19 epidemic.

METHODS

Study design

A retrospective cohort study was done by manually reviewing and extracting data from electronic medical records (EMR) data on the data of initial PA from surgery to the data of the procedure for lumbar surgery at Alpine Spine Orthopedic Surgery Center in Spokane, WA. The time frame was from April 2017 to May 2018 and then compared to February 2022 to October 2023. Approval from the appropriate Institutional Review board (IRB) was obtained. We used Current procedural technology (CPT) codes (22612, 22614, 63030, 63047, 63048) to identify patients who had lumbar surgery.

Data source

All data for EMRs was accessed through Athena health electronic records. We reviewed and extracted data from the orthopaedic clinical notes, notification notes, billing notes and records and imaging reports. The following demographic and medical histories were abstracted: age, race, insurance type, body mass index (BMI), history of hypertension (HTN), history of heart disease, and history of diabetes. The following preoperative and operative data was abstracted such as date of first preoperative visit, date of surgery and date of PA request.

Inclusion and exclusion criteria

A review of 400 patient charts was conducted which had a type of lumbar surgery as defined by the CPT codes. 363 patients met the inclusion and exclusion criteria. Patients were included in the study if there was documentation of preoperative visits at the orthopaedic clinic and documentation of PA requests in a patient who is medically cleared.

We excluded patients if their surgery was a repeat procedure, Labor and Industries (L and I) claim, Tricare/Government insurance, motor-vehicle insurance, concomitant thoracic surgery, or data was missing from the categories being studied. Patients of any age and any comorbidities were included. Since Medicare does not require PA, the interval from preoperative clinic visit to surgery was recorded for consistency.

Statistical analysis

R version 4.3.2 was used for statistical analysis. Cohorts were identified based on the years of surgery (2017-2018 and 2022-2023). Subsequently, patients were stratified by age, sex, comorbidities (hypertension, heart disease, diabetes, prior spine surgeries), and PA days. Two-way ANOVA was used to assess demographic and comorbidity differences between groups. Post-hoc pairwise comparisons were performed using Tukey's honestly significant difference (HSD) test. Statistical significance was defined as $p<0.05$.

RESULTS

A total of 400 patient charts were reviewed, of which 363 met inclusion criteria. Of these, 181 patients underwent lumbar fusion between April 2017 and May 2018, and 182 patients underwent surgery between February 2022 and October 2023. The mean age of the cohort was similar across the two periods (60.8±11.9 years in 2017-2018 and 61.1±12.3 years in 2022-2023), and the sex distribution was balanced, with 51.4% female in 2017-2018 and 52.2% female in 2022-2023 (Table 1).

Comorbidity distributions were comparable across both time periods. Hypertension was the most common comorbidity, present in 56 patients in 2017-2018 and 53 patients in 2022-2023, while diabetes was present in 34 and 31 patients, respectively. Rates of chronic obstructive pulmonary disease, chronic kidney disease, and coronary artery disease were similar between the two cohorts (Table 2). Analysis of the primary outcome revealed a significant increase in the time from PA request to surgery following the COVID-19 pandemic.

The overall mean PA interval increased from 38.7±14.2 days in 2017-2018 to 60.4±15.8 days in 2022-2023. This difference was statistically significant by independent two-sample t-test (t =-10.87, p<0.001). When stratified by sex, female patients had slightly longer PA intervals than male patients in the 2022-2023 cohort. Specifically, in 2017-2018, approval intervals were similar between females (39.1±13.6 days) and males (38.2±14.9 days).

As shown in Figure 2, females had longer delays (62.0±15.1 days) compared to males (58.5±16.3 days, p=0.03) in 2022-2023. We then evaluated differences in PA delays across payer types. Two-way ANOVA demonstrated significant main effects of both year [F (1,357)=148.77, p<0.001] and payer [(F (2,357)=55.24, p<0.001], while the interaction between year and payer was not significant [F (2,357)=0.11, p=0.90). Tukey HSD post-hoc testing showed that medicaid patients experienced significantly longer PA intervals than private patients in both time periods, and differences between medicaid and Medicare were small and not statistically significant.

In the 2022-2023 cohort, medicaid patients waited longer than Private patients by a mean of 66.7-53.9=12.8 days (p<0.001), and the medicaid-medicare difference was not significant (p=0.59). Across all payer groups, PA intervals were longer in 2022-2023 than in 2017-2018, with the largest absolute increases observed among Medicaid and Medicare patients, reinforcing a widening gap relative to private patients (Figure 1).

Table 1: Displays the breakdown of demographics collected for 181 patients in 2017-2018 and 182 patients for 2022-2023 grouped by sex, mean age, and mean PA days.

Years	Sex	Patients (N)	Mean age (years)	Mean PA Days
2017-2018	Female	88	60.0±9.9	40.2±12.9
2017-2018	Male	93	60.3±11.8	40.7±11.3
2022-2023	Female	95	61.8±10.7	62.0±15.1
2022-2023	Male	87	61.1±10.9	58.5±16.3

Table 2: The breakdown of patients positive for comorbidities.

Years	TDM	HTN	COPD	CKD
2017-2018	34/181 (18.8%)	56/181 (30.9%)	22/181 (12.2%)	12/181 (6.6%)
2022-2023	31/182 (17.0%)	53/182 (29.1%)	15/182 (8.2%)	12/182 (6.6%)

Note: TDM: Diabetes mellitus, HTN: Hypertension, COPD: Chronic obstructive pulmonary disease, CKD: Chronic kidney disease, CAD: Coronary artery disease.

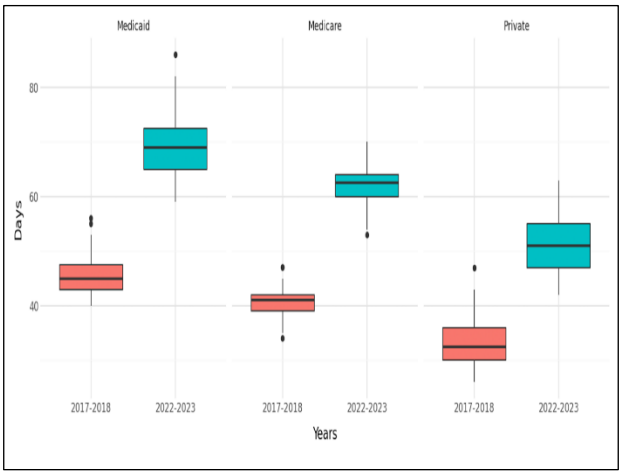

Figure 1: Mean number of PA days compared to insurance types for the year 2017-2018 and 2022-2023.

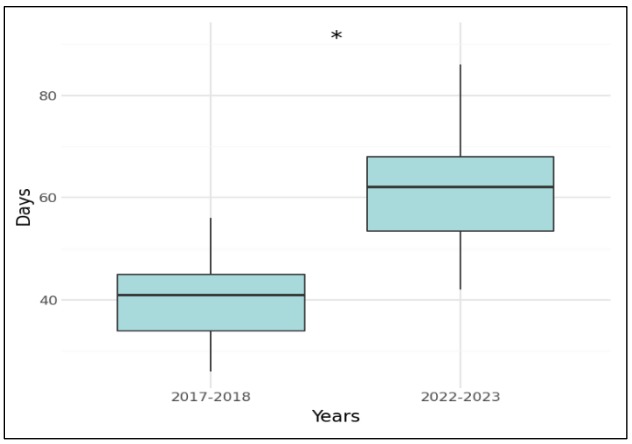

Figure 2: Mean number of PA days 2017-2018 vs. 2022-2023.

DISCUSSION

This retrospective cohort study demonstrates a significant increase in PA delays for lumbar surgery in the post-COVID-19 era, with mean wait times rising from 38.7 days in 2017-2018 to 60.4 days in 2022-2023. This nearly 50% increase highlights how pandemic-related disruptions compounded preexisting inefficiencies in the U.S. healthcare system. Our findings are consistent with broader literature suggesting that PA, while initially intended to improve quality and reduce unnecessary

interventions, has increasingly served as a barrier to timely care.[6,7,12]

The disparity in delays across insurance types is particularly noteworthy. Patients with medicaid consistently experienced longer wait times compared to those with private insurance, with the gap widening in the 2022-2023 cohort. This inequity mirrors prior work in other specialties, where public insurance payers were associated with greater administrative hurdles and slower access to care. For example, Carlisle *et al.* found that dermatology departments incurred substantial administrative costs and longer delays due to PA requirements without measurable improvement in patient outcomes.[10] Similarly, Sundaram et al reported that PA in urology increased practice burden while delaying care for patients.[15] Taken together, these findings suggest that payer-related variability in the PA process may reinforce existing disparities in surgical access.

The COVID-19 pandemic likely intensified these challenges by straining healthcare resources, but our results indicate that systemic issues with PA extend beyond pandemic-related disruptions. Indeed, a U.S. Department of Health and Human Services (HHS) report noted that Medicare Advantage organizations denied appropriate medical care approximately 20% of the time, raising concerns about access to medically necessary treatment.[13] Such findings underscore that PA delays are not solely attributable to clinical review but may also reflect payer practices that limit care utilization.

Our analysis also revealed a modest sex-based disparity in PA delays, with women experiencing longer wait times than men in the 2022-2023 cohort. While the reasons for this difference remain unclear, prior research has demonstrated that structural barriers to care can disproportionately affect women. Strohl et al for example, identified surgical wait time as a meaningful health indicator in gynecologic oncology, with delays linked to worse outcomes.[5] Similarly, Kinsey et al recently reported that socioeconomic status, including insurance coverage, was a significant determinant of surgical wait times for nonemergent gynecologic procedures.[16] Although lumbar surgery differs in pathology, the persistence of sex differences in administrative delays warrants further investigation. Such findings highlight the potential persistent role of structural inequities across specialties and reinforce the need for policy reform to ensure equitable access to elective surgery. Beyond payer status, other systemic factors are known to influence surgical timeliness. Essen et al demonstrated that weekend admissions for orthopaedic trauma led to longer delays and more frequent after-hours operations, emphasizing how organizational factors, rather than clinical necessity alone, drive access to surgery.[17] Similarly, in our study, administrative requirements related to PA not patient demographics or comorbidity burden were primary drivers of delay. Together, these findings underscore that systemic inefficiencies, whether administrative or organizational, significantly affect surgical timing.

Encouragingly, evidence suggests that targeted interventions can reduce surgical delays. Quercioli et al evaluated a multi-intervention strategy combining administrative streamlining and process optimization, demonstrating measurable reductions in elective surgery wait times.[18] The necessity for these reforms is underscored by evidence that current prior authorization mandates for common orthopedic procedures are an ineffective cost-saving measure that instead increases administrative burdens and leads to significant delays in patient care.[19] Translating such approaches into the PA process such as standardized approval pathways, automation, or payer-provider coordination may help reduce delays and improve access for patients requiring lumbar surgery.

Ultimately, these findings add to the growing body of literature questioning the utility of PA in its current form. While originally intended as a mechanism to promote value-based care, evidence suggests that PA introduces administrative costs, delays access, and may not meaningfully improve quality.[7,10,15]

Limitations

This study has several limitations. First, it was conducted at a single orthopaedic surgery center in Eastern Washington, which may limit generalizability to other regions or institutions with different payer mixes and administrative practices. Second, while we controlled basic demographics and comorbidities, we were unable to account for all potential confounders such as surgical complexity, disease severity, or individual surgeon practice variation. Third, the retrospective design introduces the potential for incomplete documentation within the electronic medical record, though manual chart review minimized this risk. Fourth, the study did not directly assess downstream clinical outcomes such as postoperative pain, disability, or return to work, which are important endpoints to determine the clinical significance of PA delays. The timing of the COVID-19 pandemic suggests that factors like staffing shortages and changing payer policies may have led to longer PA intervals. Additionally, outdated triage algorithms from the pandemic may have been kept in 2022-2023 to preserve finances. Future multi-center prospective studies with detailed outcome measures will be necessary to validate and extend our findings.

CONCLUSION

PA delays for lumbar surgery have significantly increased since the COVID-19 pandemic, with mean wait times extending by over three weeks compared to pre-pandemic levels. Patients insured through Medicaid continue to face the longest delays, highlighting inequities across payer types. Our findings reinforce concerns raised in prior

literature regarding the inefficiency and inequity of PA requirements and support calls for policy reform to reduce unnecessary barriers to surgical care. Future studies should evaluate the downstream effects of PA delays on clinical outcomes, including pain, disability, and quality of life, to better inform evidence-based policy changes. Streamlining or reforming PA procedures will be essential to ensuring timely, equitable access to care for patients with degenerative lumbar disease.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

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Cite this article as: Sangha HS, Tiwana HS, Schmidt M. Impact of the COVID-19 pandemic on prior authorization delays for lumbar surgery: a retrospective cohort study. Int J Res Orthop 2026;12:56-60.