## Immediate Procedure Reimbursement and Episode Payments are Lower for Lumbar Laminectomy in Ambulatory Surgery Centers versus Hospital Outpatient Departments

Justin Tiao, Mayuri Jain, Ryan Hoang, Alexander Yu, Jonathan J Huang, Andrew C Hecht, Brocha Stern, Saad Chaudhary

INTRODUCTION: Lumbar laminectomy is a commonly performed surgical procedure for decompression of the spinal canal due to degenerative lumbar spine conditions such as stenosis, radiculopathy, and disc herniation. Increasingly, these procedures are performed in outpatient settings, specifically ambulatory surgery centers (ASCs) and hospital outpatient departments (HOPDs). However, financial differences between these settings are not well-defined. This study compares immediate procedure reimbursements, surgeon-specific reimbursements, patient out-of-pocket (OOP) expenditures, and 30-day and 90-day episode payments associated with single-level and multi-level lumbar laminectomies performed at ASCs versus HOPDs in commercially insured patients.

METHODS: We conducted a retrospective cohort analysis utilizing data from the Merative MarketScan Commercial Claims and Encounters Database. Patients aged 18-64 who underwent a lumbar laminectomy (CPT code 63047, with CPT code 63048 identifying multi-level procedures) between January and September 2021 were included. Propensity score matching (1:2, ASC:HOPD) was performed based on age, sex, insurance type, geographic region, Charlson Comorbidity Index, obesity status, tobacco use, anxiety, mood disorders, opioid-naïve status, and spinal diagnoses to minimize selection bias. Financial variables analyzed included immediate procedure reimbursements, surgeon reimbursements, and total payments within 30-day and 90-day postoperative episodes as well as OOP expenditures for each of the other variables. Generalized linear models with gamma distribution and log link function were employed to estimate adjusted mean differences between settings, accounting for surgeon and facility network status. Postoperative health care utilization metrics (e.g., readmissions) was summarized for each setting to better characterize sources of payments.

RESULTS:

The matched sample included 699 single-level (36.9% ASC) and 694 multi-level (36.0% ASC) lumbar laminectomy cases. Immediate procedure reimbursements were significantly lower in ASCs compared to HOPDs (single-level: ASC $12,397 vs. HOPD $14,789, mean difference -$2,492, P=0.001; multi-level: ASC $13,059 vs. HOPD $18,237, mean difference -$5,629, P<0.001) (Table 1). Surgeon reimbursements were significantly higher for single-level procedures performed in ASCs ($911 higher, P<0.001), with no significant differences observed in surgeon reimbursements for multi-level procedures. Payments remained lower for ASCs at both the 30-day episode (single-level: -$4,354; multi-level: -$7,781; both P<0.001) and 90-day episode (single-level: -$3,757; multi-level: -$8,465; both P<0.001). Patient OOP expenditures were similar between settings except for surgeon-specific expenditures for single-level procedures, which were slightly higher in ASCs ($185 more, P=0.01). Postoperative healthcare utilization metrics indicated higher rates of readmissions and outpatient rehabilitation utilization for procedures performed at HOPDs.

DISCUSSION AND CONCLUSION: Our findings demonstrate significant financial savings associated with performing lumbar laminectomies in ASCs compared to HOPDs, evident in immediate procedure reimbursements and sustained throughout 30-day and 90-day postoperative periods. Higher surgeon reimbursements for single-level cases in ASCs may incentivize the transition of suitable procedures to these settings. Despite significant cost reductions, patient OOP expenditures remain largely unaffected. The observed lower healthcare utilization postoperatively in ASCs supports the notion that ASCs can deliver efficient care without compromising quality. These results underscore the financial and clinical advantages of performing lumbar laminectomies in ASCs for commercially insured patients.

**Table 1. Adjusted Between-Setting Comparisons of Financial Outcomes in the Matched Single-Level and Multi-Level Lumbar Laminectomy Cohorts**

| | Single-Level Cohort: After Matching (1:2 ratio) | | | |
|---|---|---|---|---|
| **Outcomes** | **ASC (n=258)** | **HOPD (n=441)** | | |
| | **Adjusted Mean (95% CI)** | **Adjusted Mean (95% CI)** | **Difference (95% CI)** | **P-Value** |
| **Immediate Procedure Reimbursement** | 12,397 (11,396 to 13,486) | 14,789 (13,880 to 15,759) | ***-2,492 (-3,836 to -949)*** | **0.001** |
| **Immediate Procedure Reimbursement: Patient** | 1,891 (1,682 to 2,126) | 1,689 (1,539 to 1,852) | 203 (-72 to 477) | 0.14 |
| **Surgeon Reimbursement** | 3,547 (3,253 to 3,867) | 2,636 (2,449 to 2,838) | ***911 (555 to 1,266)*** | **<0.001** |
| **Surgeon Reimbursement: Patient** | 851 (746 to 970) | 665 (590 to 750) | ***185 (51 to 320)*** | **0.01** |
| **30-Day Payments** | 13,409 (12,346 to 14,563) | 17,762 (16,683 to 18,912) | ***-4,354 (-5,941 to -2,766)*** | **<0.001** |
| **30-Day Payments: Patient** | 1,871 (1,623 to 2,156) | 1,661 (1,489 to 1,835) | 209 (-116 to 534) | 0.21 |
| **90-Day Payments: Gross** | 16,414 (15,077 to 17,868) | 20,170 (18,912 to 21,512) | ***-3,757 (-5,688 to -1,825)*** | **<0.001** |
| **90-Day Payments: Patient** | 2,036 (1,785 to 2,322) | 1,785 (1,613 to 1,975) | 251 (-75 to 577) | 0.13 |
| | **Multi-Level Cohort: After Matching (1:2 ratio)** | | | |
| | **ASC (n=250)** | **HOPD (n=444)** | | |
| | **Adjusted Mean (95% CI)** | **Adjusted Mean (95% CI)** | **Difference (95% CI)** | **P-Value** |
| **Immediate Procedure Reimbursement** | 13,059 (12,103 to 14,091) | 18,237 (17,316 to 19,398) | ***-5,269 (-6,719 to -3,818)*** | **<0.001** |
| **Immediate Procedure Reimbursement: Patient** | 1,943 (1,713 to 2,203) | 1,964 (1,784 to 2,163) | -21 (-332 to 289) | 0.89 |
| **Surgeon Reimbursement** | 3,365 (3,057 to 3,704) | 3,735 (3,472 to 4,017) | -370 (-789 to 48) | 0.08 |
| **Surgeon Reimbursement: Patient** | 634 (547 to 736) | 757 (670 to 855) | -122 (-253 to 8) | 0.07 |
| **30-Day Payments** | 13,792 (12,789 to 14,875) | 21,573 (20,386 to 22,829) | ***-7,781 (-9,391 to -6,170)*** | **<0.001** |
| **30-Day Payments: Patient** | 1,883 (1,634 to 2,170) | 1,945 (1,748 to 2,165) | -62 (-402 to 279) | 0.72 |
| **90-Day Payments: Gross** | 15,695 (14,480 to 17,013) | 24,160 (22,746 to 25,663) | ***-8,465 (-10,401 to -6,529)*** | **<0.001** |
| **90-Day Payments: Patient** | 1,995 (1,735 to 2,282) | 2,047 (1,850 to 2,265) | -52 (-392 to 289) | 0.77 |

ASC = ambulatory surgery center; HOPD = hospital outpatient department.
All financial variables are in 2021 US dollars. "Patient" refers to patient out-of-pocket expenditures.
***Bolded*** Difference in means are statistically significant (P < 0.05)