

## **Performance Scores in the Merit-based Incentive Payment System are Increasing Among Arthroplasty Surgeons who Treat High Social Risk Caseloads**

Vikram Singh Gill, Eugenia Lin, Alejandro Miguel Holle, Jack Haglin<sup>1</sup>, Joshua Bingham, Mark J Spangehl<sup>1</sup>, Henry D Clarke<sup>1</sup>

<sup>1</sup>Mayo Clinic

**INTRODUCTION:** The Merit-based Incentive Payment System (MIPS) which sought to promote value-based over volume-based care by reimbursing providers based on an overall value performance score, recently introduced the complex patient bonus in 2019 to award physicians who treat patients with high social risk. However, no prior studies have evaluated how this change influenced overall MIPS performance scores among arthroplasty surgeons. Thus, the purpose of this study was to examine how arthroplasty surgeon MIPS scores and payment adjustments, as well as surgeon demographics, practice characteristics, and patient population, varied based on the social risk of their caseload from 2017, the year MIPS was introduced, to 2021.

**METHODS:** Multiple databases published by the Centers for Medicare and Medicaid Services (CMS) were combined and utilized to examine all U.S. orthopaedic surgeons who submit at least 11 Medicare claims in a given year. Data was filtered to only include arthroplasty surgeons billing for at least 10 elective total knee arthroplasties (TKA) or 10 elective total hip arthroplasties (THA). Surgeons were placed into quintiles of social risk based on the proportion of their patient population that was dual eligible for Medicare-Medicaid, with the highest quintile representing the highest social risk patient cohort and the lowest quintile representing the lowest social risk patient cohort. Demographics, practice location characteristics including Distressed Community Index (DCI) scores, patient population information, and MIPS performance were assessed in years 2017 and 2021. Differences between social risk quintiles were assessed utilizing chi-square, student *t*-test, Wilcoxon signed rank test, and multivariable logistic regressions.

**RESULTS:** There were 6,957 joint arthroplasty surgeons who treated dual-Medicare-Medicaid patients in 2017 and 6,072 surgeons in 2021. In 2021, arthroplasty surgeons with high-risk caseloads more often worked in the East North Central region (20.1% vs 12.3%,  $p<0.001$ ), more often DO trained (14.2% vs 8.1%,  $p<0.001$ ), had fewer years in practice (22.7 vs 27.2,  $p<0.001$ ) and had fewer partners in practice (64 vs 96,  $p<0.001$ ) compared to those with low social risk caseloads. Additionally, arthroplasty surgeons with high-risk caseloads had fewer Medicare beneficiaries (369 vs 616,  $p<0.001$ ), saw patients with a higher comorbidity burden (1.3 vs 0.98,  $p<0.001$ ), and worked in areas with a higher DCI distress score (57.6 vs 34.5,  $p<0.001$ ) compared to those with low social risk caseloads in 2021. Similar findings were observed in 2017 (Table 1). With regard to MIPS performance, in 2017, arthroplasty surgeons with the highest social risk caseloads scored significantly lower on MIPS (70.0 vs 73.5,  $p = 0.012$ ), were more likely to receive a negative payment adjustment (OR: 1.64; 95% CI: 1.01-2.68,  $p=0.046$ ), and significantly less likely to receive an exceptional performance bonus (OR: 0.72; 95% CI: 0.56-0.96,  $p=0.025$ ) compared to surgeons with the lowest social risk caseload. In 2021, arthroplasty surgeons with the highest social risk caseloads remained more likely to receive a negative payment adjustment (OR: 3.98; 95% CI: 1.63-10.53,  $p=0.003$ ), but were also more likely to receive exceptional performance bonus (OR: 1.28; 95% CI: 1.02-2.62,  $p=0.031$ ) compared to those with low social risk caseloads (Table 2).

**DISCUSSION AND CONCLUSION:** Before the implementation of the complex patient bonus, in 2017, arthroplasty surgeons with high social risk caseloads were more likely to receive a payment penalty and less likely to receive an exceptional performance bonus on MIPS compared to surgeons with a low social risk. These findings partially reversed by 2021, coinciding with the introduction of the complex patient bonus. This suggests that policy adjustments, such as the complex patient bonus, may have played a role in beginning to address inequities in performance assessments among arthroplasty surgeons, but there remains room for improvement. These findings are important in the context of ongoing evolution of value-based payment models, especially as Medicare recently announced the rollout of its latest large-scale payment model, the Transforming Episode Accountability Model (TEAM) in 2026. Future research should continue to evaluate these trends to ensure equitable care to patients and adequate support to arthroplasty surgeons who are delivering care to high-risk patients under evolving payment models.

Bar chart showing MIPS Performance Score by Quintile for 2017 and 2021. The Y-axis represents the MIPS Performance Score (0 to 100). The X-axis represents the Year (2017 and 2021). The legend indicates Quintile 1 (dark blue), Quintile 2 (orange), Quintile 3 (green), Quintile 4 (light blue), and Quintile 5 (purple).

Year	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5
2017	72	73	74	75	68
2021	78	79	80	81	82

Variable	2017		p-value	2018		p-value
	High Income US Quintile	Low Income US Quintile		High Income US Quintile	Low Income US Quintile	
<b>Region</b>						
North	101.1	100.8	0.837	101.5	101.6	0.838
South	100.9	101.2	0.850	101.5	101.4	0.851
<b>Age Group</b>						
18-24	101.1	100.8	0.837	101.5	101.6	0.838
25-34	101.1	100.8	0.837	101.5	101.6	0.838
35-44	101.1	100.8	0.837	101.5	101.6	0.838
45-54	101.1	100.8	0.837	101.5	101.6	0.838
55-64	101.1	100.8	0.837	101.5	101.6	0.838
65+	101.1	100.8	0.837	101.5	101.6	0.838
<b>Gender</b>						
Male	101.1	100.8	0.837	101.5	101.6	0.838
Female	101.1	100.8	0.837	101.5	101.6	0.838
<b>Ethnicity</b>						
White	101.1	100.8	0.837	101.5	101.6	0.838
Black	101.1	100.8	0.837	101.5	101.6	0.838
Hispanic	101.1	100.8	0.837	101.5	101.6	0.838
Asian	101.1	100.8	0.837	101.5	101.6	0.838
Native American	101.1	100.8	0.837	101.5	101.6	0.838
Pacific Islander	101.1	100.8	0.837	101.5	101.6	0.838
<b>Marital Status</b>						
Married	101.1	100.8	0.837	101.5	101.6	0.838
Single	101.1	100.8	0.837	101.5	101.6	0.838
Divorced	101.1	100.8	0.837	101.5	101.6	0.838
Widowed	101.1	100.8	0.837	101.5	101.6	0.838
<b>Religious Affiliation</b>						
Protestant	101.1	100.8	0.837	101.5	101.6	0.838
Catholic	101.1	100.8	0.837	101.5	101.6	0.838
Jewish	101.1	100.8	0.837	101.5	101.6	0.838
Muslim	101.1	100.8	0.837	101.5	101.6	0.838
Hindu	101.1	100.8	0.837	101.5	101.6	0.838
Buddhist	101.1	100.8	0.837	101.5	101.6	0.838
Other	101.1	100.8	0.837	101.5	101.6	0.838
<b>Political Affiliation</b>						
Democrat	101.1	100.8	0.837	101.5	101.6	0.838
Republican	101.1	100.8	0.837	101.5	101.6	0.838
Independent	101.1	100.8	0.837	101.5	101.6	0.838
<b>Health Insurance</b>						
Medicare	101.1	100.8	0.837	101.5	101.6	0.838
Medicaid	101.1	100.8	0.837	101.5	101.6	0.838
Private	101.1	100.8	0.837	101.5	101.6	0.838
None	101.1	100.8	0.837	101.5	101.6	0.838
<b>Income Source</b>						
Wages	101.1	100.8	0.837	101.5	101.6	0.838
Dividends	101.1	100.8	0.837	101.5	101.6	0.838
Social Security	101.1	100.8	0.837	101.5	101.6	0.838
Other	101.1	100.8	0.837	101.5	101.6	0.838

Social Risk Quintile	Negative Payment Adjustment			Exceptional Performance Bonus			
	2017		2021	2017		2021	
	Adjusted odds ratio of receiving a penalty (95% CI)	P-value	Adjusted odds ratio of receiving a penalty (95% CI)	Adjusted odds ratio of receiving an exceptional performance bonus (95% CI)	P-value	Adjusted odds ratio of receiving an exceptional performance bonus (95% CI)	
Quintile One	1 [Reference]		1 [Reference]	1 [Reference]		1 [Reference]	
Quintile Two	0.90 (0.54-1.41)	0.64	2.28 (0.55-0.58)	0.038	0.94 (0.74-1.16)	0.53	
Quintile Three	0.94 (0.69-1.30)	0.81	1.45 (0.37-3.87)	0.43	0.84 (0.67-1.05)	0.13	
Quintile Four	1.03 (0.86-1.20)	0.78	0.58 (0.34-0.95)	0.19	0.77 (0.65-0.90)	0.057	
Quintile Five	1.64 (1.01-2.48)	0.035	0.53	0.003	0.72 (0.58-0.96)	0.025	
						1.28 (0.99-1.62)	0.056