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## The COVID-19 Pandemic and Centers of Medicaid and Medicare Services Regulatory Reform Impact on Total Hip Arthroplasty Metrics



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### ABSTRACT

**Background:** Shifts in demand, capacity, and site of service have impacted total hip arthroplasty (THA) volumes and revenues over the 2019–2021 time period. Moving THA off the inpatient-only (IPO) list and the COVID-19 pandemic has caused a shift in delivery away from inpatient services and a decrease in demand.

**Methods:** Medicare claims data were surveyed for the latest period available (April 1, 2020 to September 2020) and compared with a similar period in 2019 prior to THA removal from the IPO list and before the COVID-19 pandemic. Length of stay (LOS), admission status, site of service, discharge status, cost to CMS (Centers of Medicaid and Medicare Services), and racial disparities were analyzed.

**Results:** From 2019 to 2020, changes in primary THA metrics occurred (overall change in total joint arthroplasty [THA plus total knee arthroplasty metrics]): CMS THA volume decreased from 78,691 to 65,360, –16% (–22%); THA performed as an outpatient increased from 0% to 51% (141%); THA performed as same-day discharge increased from 3% to 12%, 325% (221%); overall LOS decreased from 1.91 to 1.46, –23% (–11%); inpatient LOS increased from 1.92 to 2.05, 7% (16%); outpatient LOS increased from 0.92 to 0.93, 1% (–12%); discharge home increased from 82% to 91%, 12.8% (11%); and CMS spending decreased from \$1,033 million to \$751 million, –27% (–27%).

**Conclusion:** Medicare payments, LOS, discharge to facilities, and volume declined from 2019 to 2020 and were accelerated by IPO list changes and COVID-19 issues. Same-day discharge and hospital outpatient department cases also increased. THA metrics were not affected by race.

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Dramatic shifts in demand, capacity, and site of service have impacted total hip arthroplasty (THA) volumes and revenues over the 2019–2021 time period. Moving THA off the inpatient-only

(IPO) list for Centers of Medicaid and Medicare Services (CMS) beneficiaries and the COVID-19 pandemic [1] has caused a shift in delivery away from inpatient services and a decrease in demand. This study is an analysis of CMS THA metrics during this difficult period for delivering elective orthopedic surgery.

Both the COVID-19 pandemic and the elimination of THA from the IPO list have greatly accelerated the implementation of outpatient THA in the CMS population. As the Delta variant surge has peaked and Omicron has emerged, new challenges for hospitals have persisted and will continue with staffing shortages in nursing, perioperative personnel, and support staff resulting in scheduling challenges for THA surgeons in hospitals. This has caused a movement toward ambulatory surgery center utilization of both THA volume and operating room support staff seeking a more predictable lifestyle and higher wages. Physician

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**Table 1**  
Changes in Hospitalization Volume per 1,000 Medicare Beneficiaries During the COVID-19 Pandemic.

	COVID-19			Aggregate		
	January/February 2020	April 2020	Change (%)	2019	2020	Change (%)
All hospitalization (sum of below)	0.80	0.12	-85%	6.58	5.00	-24%
White	0.91	0.14	-84%	7.44	5.74	-23%
Non-White	0.38	0.05	-88%	3.36	2.30	-31%
Types of hospitalization						
Primary TKA	0.45	0.01	-97%	3.55	2.45	-31%
White	0.51	0.01	-97%	3.97	2.78	-30%
Non-White	0.22	0.01	-97%	1.99	1.23	-38%
Primary TKA non-fracture	0.23	0.01	-94%	1.98	1.60	-19%
White	0.26	0.02	-94%	2.26	1.85	-18%
Non-White	0.10	0.01	-95%	0.93	0.70	-25%
Primary TKA fracture	0.08	0.08	-7%	0.75	0.70	-7%
White	0.10	0.09	-6%	0.88	0.83	-6%
Non-White	0.03	0.03	-20%	0.28	0.25	-8%
Revision	0.03	0.01	-55%	0.30	0.25	-17%
White	0.04	0.02	-55%	0.34	0.28	-16%
Non-White	0.02	0.01	-60%	0.17	0.13	-25%

TKA, total knee arthroplasty.

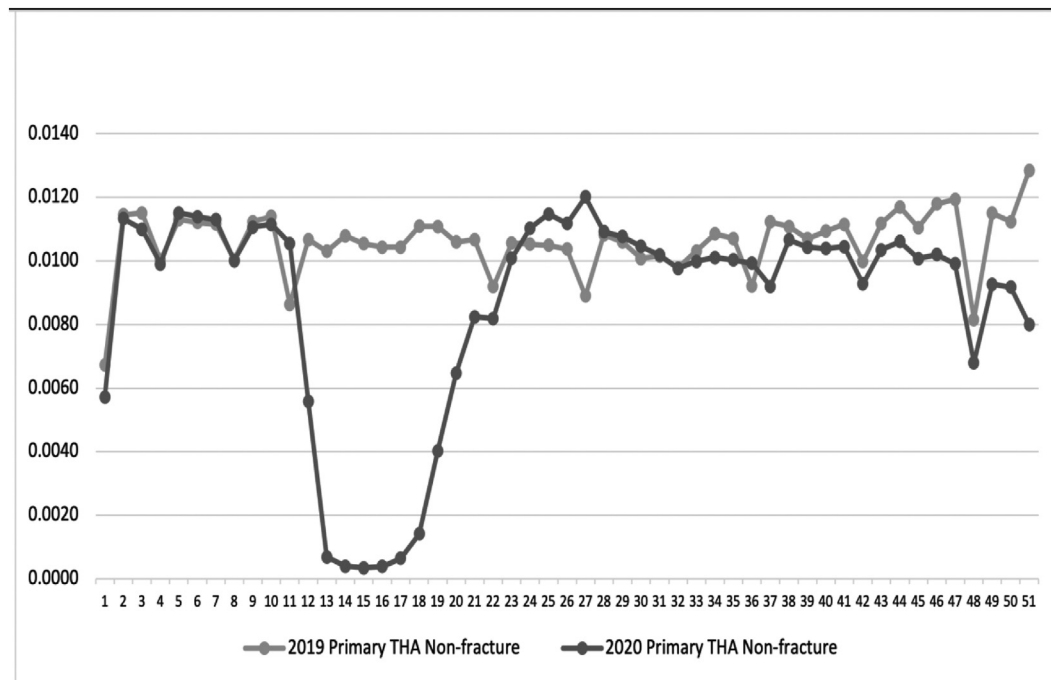
shortages in primary care, anesthesia, and surgical services have caused access problems both in primary care and in THA surgical care [2,3]. The aim of the current study is to assess the removal of THA from CMS's IPO list and the simultaneous effect of the COVID-19 pandemic on THA demand, CMS finances, and delivery care pathway metrics, resulting in the rapid shift away from inpatient THA.

**Methods**

Medicare claims data were surveyed for the latest period available (April 1, 2020 to September 30, 2020) and compared with a similar period in 2019 before THA came off of the IPO list and before the COVID-19 pandemic impacted the US healthcare system. Length of stay (LOS), admission status, site of service, discharge status, cost to CMS, and racial disparities were analyzed. Volume

differences in THA intervention for fracture vs non-fracture patients were also analyzed.

We used 100% Centers for Medicare and Medicaid Service (CMS) fee-for-service inpatient and outpatient claims data, and Medicare enrollment data spanning 2019-2020. We identified April 2020 as the first full month after the onset of the COVID-19 pandemic, and therefore set April 1, 2020 as the start date for the COVID-19 period. Since at the time of our analysis, the claims data extended through December 31, 2020, we examined cases admitted by December 18 to ensure we could capture the full LOS. We examined the same time period of cases (April 1 to December 18 admissions) in 2019 as in 2020 to ensure comparability between the years. The study included primary THAs (and total knee arthroplasty [TKA] to calculate a comparison for all total joint arthroplasty [TJA] admissions) that were coded as inpatient using diagnosis-related group 469 and 470, and outpatient using primary Current Procedural



**Fig. 1.** Weekly average hospitalization volume per 1,000 medicare beneficiaries for primary THA non-fracture. THA, total hip arthroplasty.

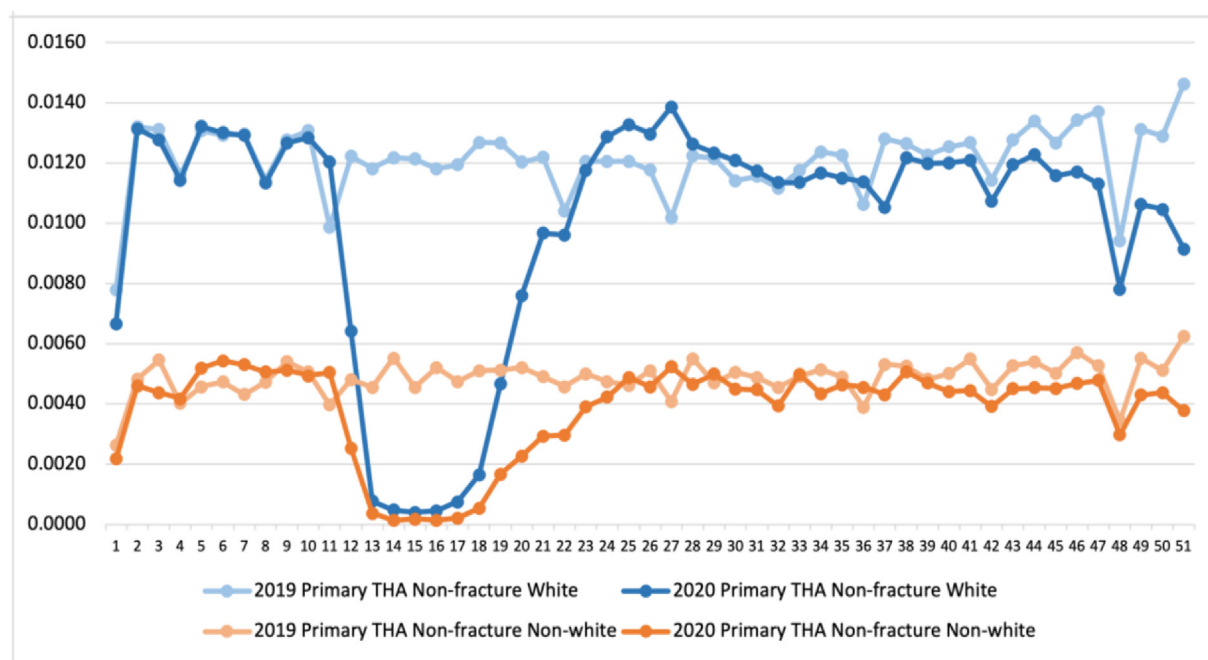


Fig. 2. Weekly average hospitalization volume per 1,000 Medicare beneficiaries for primary THA non-fracture by race. THA, total hip arthroplasty.

Terminology code 27130 for THAs (and 27447 for TKAs for TJA calculation). The study also included revision of THA using diagnosis-related group 466 and 467 for inpatient, and Current Procedural Terminology codes 27134, 27137, and 27138 for outpatient hip revisions.

Within the inpatient setting, we identified hip procedures through each case's primary International Classification of Diseases 10th Revision Procedure (ICD-10-PCS) codes. We also identified if a case involved a hip fracture through its primary ICD-10 diagnosis codes. We then divided our data into the following groups: primary THAs, primary non-fracture THAs, primary fracture THAs, and revision THAs.

We defined race and ethnicity using the race variable from the Medicare beneficiary enrollment data. Race and ethnicities include White, Black, Hispanic, Asian, other, and unknown. We grouped minorities including Black, Hispanic, Asian, and other into the non-White racial group to compare with the White racial group.

For outcome metrics, we examined the total case volume, index hospitalization (hospitalization where the arthroplasty occurred) LOSs, percentage of cases discharged home post arthroplasty, percentage of cases readmitted within 30 days after the index hospitalization, percentage of cases coded as outpatient, percentage of cases with same-day discharge (SDD), and average reimbursement per case for physicians. We compared the changes in these metrics between 2019 and 2020.

## Results

From 2019 to 2020, the following changes in primary THA metrics occurred (overall change in TJA [THA plus TKA] metrics). CMS THA volume decreased from 78,691 to 65,360 which resulted in a 16% decrease with a 22% decrease in TJA volume. THA performed as an outpatient increased from 0% to 51% in the CMS beneficiary population, a 141% increase in utilization (Tables 1 and Fig. 1). THA performed as SDD increased from 3% to 12% which was a 325% increase with a 221% increase for TJA volume. Overall, LOS decreased from 1.91 to 1.46 days resulting in a 23% reduction in THA

LOS and an 11% reduction in overall TJA LOS. Inpatient LOS increased from 1.92 to 2.05 days which was a 7% increase in THA LOS and a 16% increase in TJA inpatient LOS. Outpatient LOS increased from 0.92 to 0.93 days which resulted in a 1% increase in outpatient THA LOS and a 12% decrease in overall TJA outpatient LOS. Racial disparities in primary and revision THA intervention rates were similar to pre-pandemic levels and continued during the pandemic (Figs. 2 and 3). There were no racial disparities for THA fracture intervention rates pre or post pandemic (Fig. 4). Revision THA intervention rates followed the same pattern of decline as primary THA rates during the COVID-19 pandemic (Fig. 3).

Discharge home increased from 82% to 91% of CMS beneficiaries with a 12.8% increase for THA patients and an 11% increase for all TJA patients. CMS spending decreased from \$1,033 million to \$751 million, with a decrease of 27% for THA and an overall 27% decrease for TJA (Fig. 5). This decrease in overall CMS outlay for THA specifically and TJA in general was a combined result of decreased episode reimbursement due to the IPO rule regulatory hospital reimbursement changes, the decrease in surgeon reimbursement due to Relative Value Unit (RVU) Update Committee changes in surgeon reimbursement, and volume decreases in intervention due to the COVID-19 pandemic [4].

## Discussion

Medicare payments dramatically declined from 2019 to 2020. LOS decreases and shift to outpatient designations were accelerated by IPO list changes and COVID-19 issues. The percentage of SDD cases also increased. Other metrics favorable to decreased spending by CMS were increased discharge to home and decreased volume. Decreased surgeon and hospital reimbursement due to the IPO rule and Relative Value Scale Update Committee regulatory changes also contributed to the decrease in cost to CMS. THA metrics were affected by race.

There are many unintended consequences to the IPO rule application and Relative Value Scale Update Committee regulatory changes. Reduced reimbursement for hospitals and surgeons raises

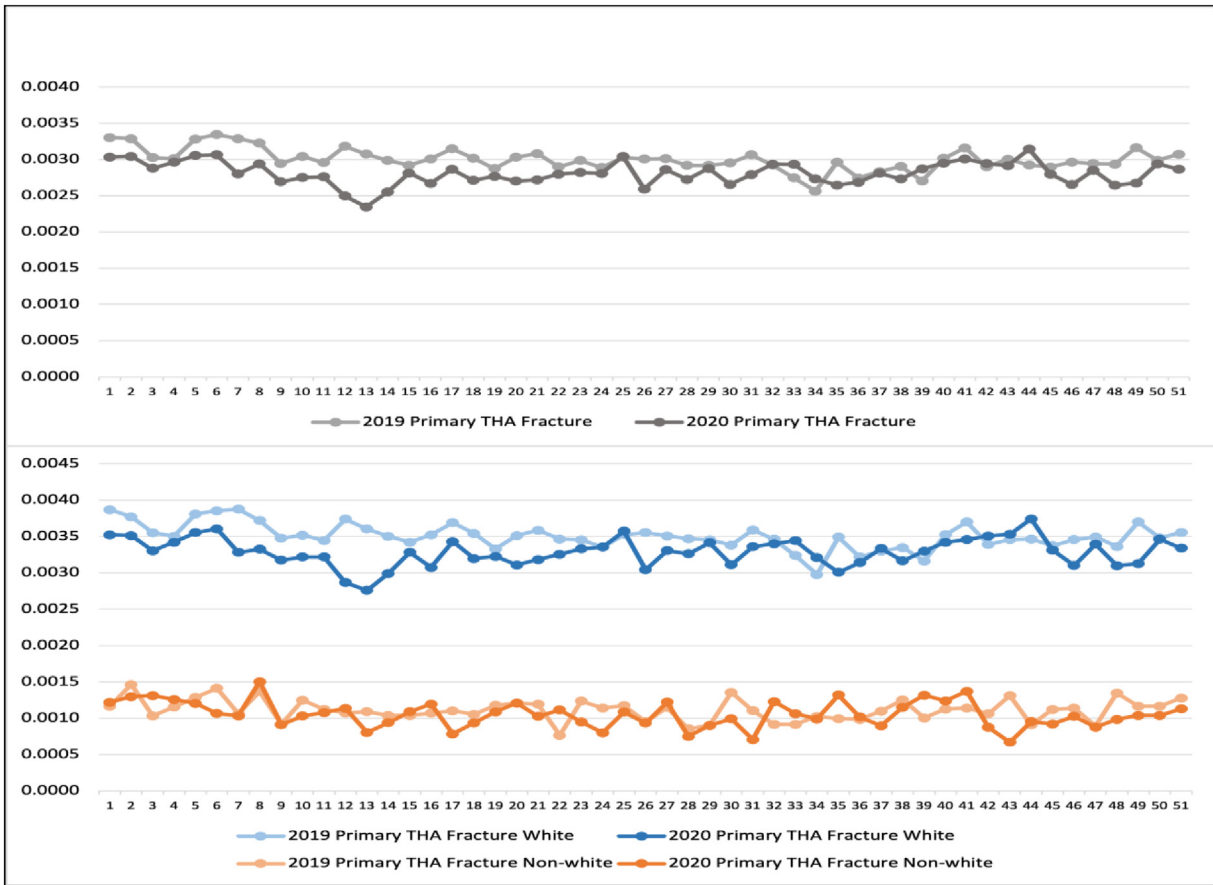


Fig. 3. Weekly average hospitalization volume per 1,000 medicare beneficiaries for revision THA non-fracture. THA, total hip arthroplasty.

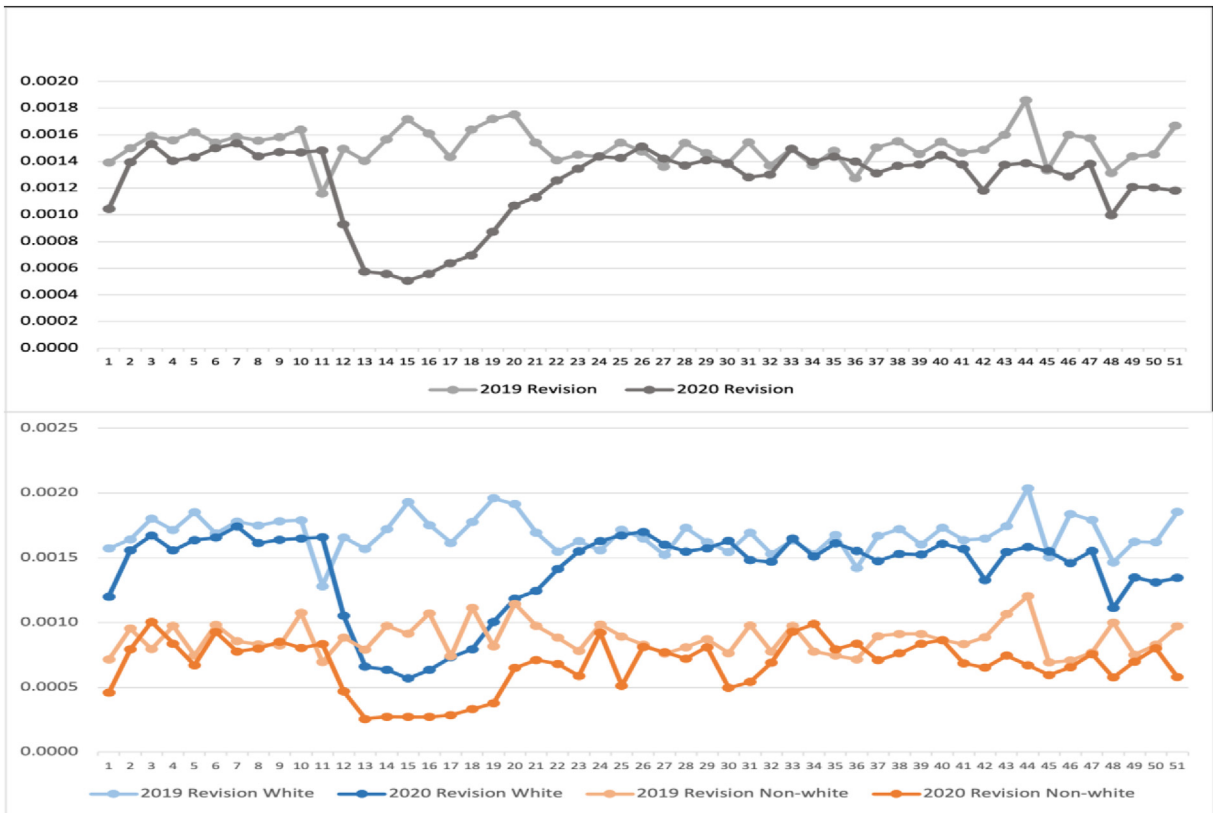


Fig. 4. Weekly average hospitalization volume per 1,000 medicare beneficiaries for primary THA due to fracture with and without race. THA, total hip arthroplasty.

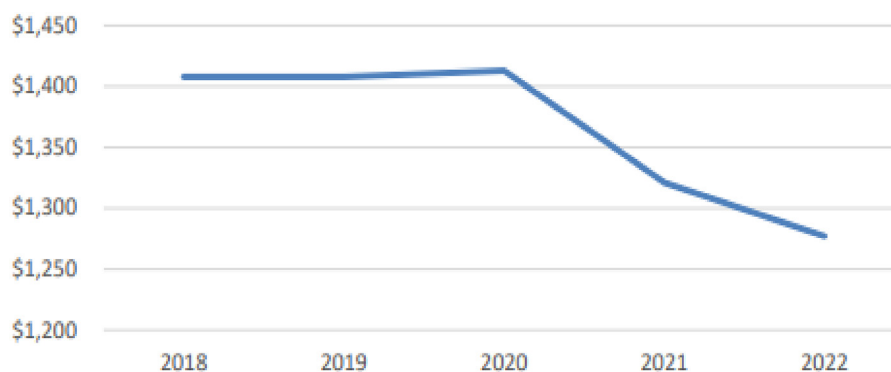


Fig. 5. Payments to physicians for total hip arthroplasty, CPT 27130. CPT, Current Procedural Terminology.

questions about sustainability of private practice, hospital employment, and the access to care for TJA patients [4]. For 2022, CMS proposes a Physician Fee Schedule conversion factor of \$33.58, which is a \$1.31 decrease from the 2021 conversion factor of \$34.89, to reflect the proposed budget neutrality adjustment that accounts for changes in RVUs and the expiration of the one-time 3.75% payment increase Congress provided through the Consolidated Appropriations Act in 2021. This will result in a 3.4% payment reduction in 2022 due to the conversion factor changes and CMS' decision to reduce wRVUs associated with TJA. A 6% Medicare surgeon reimbursement cut has been delayed until 2023. In addition, the current inflationary environment projected at >5% in which we currently practice will increase the impact of these cuts. Over the next 3 years the combined effect of these reductions may amount to a >15% reduction in surgeon reimbursement [4].

The limitations of this study are consistent with all database studies and the data are only as accurate as the reporting agency which bears responsibility for collection. Quality metrics and economic data only reflect fee-for-service Medicare beneficiaries and not Managed Medicare, Medicare Advantage, or Dual Eligible Medicare patients. Additionally, changes in TJA surgical volume may have been influenced by changes in access to care, COVID-19 restrictions, staffing reductions, site of service questions related to the IPO rule, and hospital TJA service line issues related to reduced margins. It remains to be seen which of these issues will persist or be rectified in the future. Hospital consolidation, hospital employment of surgeons, the challenges of private practice in a decreasing reimbursement environment, and the limitation of access of some patients to Ambulatory Surgery Centers (ASCs) are problems which cannot be analyzed in this data set and have profound influence over the future of THA care.

The COVID-19 pandemic has accelerated the move to SDD and hospital outpatient department TJA and the use of ASCs for TJA [5]. Now that Medicare has removed both THA (2018) and TKA (2020) from the IPO list, these procedures for Medicare recipients can take place in free-standing ASCs [6]. The surgeon and patient remain the best judges of the appropriate site of care for patients in a shared decision-making model. The unintended impact of the IPO rule and decreased volume associated with the COVID-19 pandemic has unfairly affected the surgeon's ability to generate revenue and to provide care to Medicare beneficiaries. These changes may lead to unforeseen future access barriers for arthroplasty care.

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