No Exceptions: Inflation-Adjusted Medicare Reimbursement Fell for Every High-Volume Orthopaedic Procedure from 2013 to 2023

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Introduction: Medicare is the largest federal health insurance program, covering more than 66 million beneficiaries. Reimbursement rates can affect patient access to care. We hypothesized a decline in reimbursement rates for the 20 most frequently billed orthopaedic procedures from 2013 to 2023.

Methods: The top 20 orthopaedic CPT codes were extracted from CMS data. Medicare professional payments were extracted from the CMS Physician Fee Schedule (PFS) and adjusted for inflation. Annual trends in reimbursement rates were analyzed.

Results: All procedures showed declining reimbursement rates from 2013 to 2023 ($p < 0.0001$). The mean annual decline was $26.26, and reimbursement ranges fell from $231–$2,321 in 2013 to $173–$1,771 in 2023. All CAGR values were negative, indicating consistent annual declines.

Conclusions: Inflation-adjusted Medicare reimbursement rates for high-volume orthopaedic procedures have consistently declined from 2013 to 2023. These findings raise questions about implications for economic barriers to patient access, hospital financial stability, and academic practice viability. Future investigations should compare Medicare and private insurance rates and evaluate procedure utilization rates, in order to help determine whether declining economic trends reduce access to orthopaedic care for older patients.

Level of Evidence: Level III; Retrospective Longitudinal Economic Analysis

Keywords: Medicare; reimbursement; orthopaedic surgery; physician fee schedule; inflation; Current Procedural Terminology; healthcare economics; patient access

INTRODUCTION

Medicare provides health coverage to more than 66 million older adults and individuals with qualifying disabilities in the United States.[1] The Centers for Medicare & Medicaid Services (CMS) establishes annual professional payment rates through the Medicare Physician Fee Schedule (PFS), which covers more than 10,000 procedures and services. Orthopaedic surgery is among the highest-volume and highest-cost specialties for Medicare beneficiaries,[2] yet inflation-adjusted Medicare reimbursement across medical and surgical specialties has steadily declined over the past two decades.[3-5]

The economic significance of these trends became particularly apparent during the inflation surge that followed the COVID-19 pandemic, when the Consumer Price Index rose at rates well above historical norms.[6-9] Because Medicare payment rates are not automatically adjusted for inflation, this period provides an informative setting in which to examine changes in the real value of orthopaedic reimbursement.

Prior studies have documented substantial inflation-adjusted reimbursement declines within orthopaedic subspecialties, including sports medicine, orthopaedic oncology, and adult reconstruction.[10-13] However, most have examined individual subspecialties or longer historical periods beginning in the early 2000s, leaving recent trends across orthopaedic surgery incompletely characterized. To address this gap, this study evaluated inflation-adjusted Medicare professional payments

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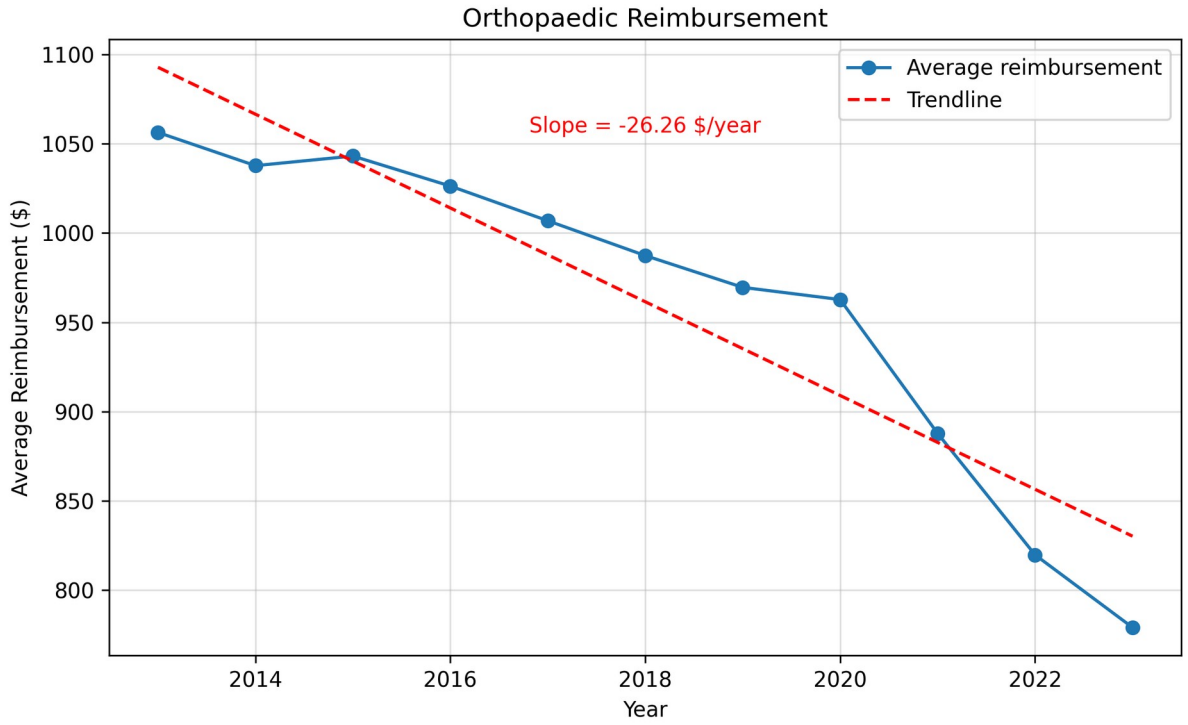
Figure 1: Mean Medicare reimbursement for the 20 most commonly performed orthopaedic procedures from 2013 to 2023. Average annual reimbursement values are shown with a linear trendline demonstrating a mean decline of $26.26 per year over the study period.



for the 20 most frequently billed facility-based orthopaedic procedures from 2013 to 2023. We hypothesized that reimbursement would decline consistently across these high-volume procedures.

METHODS

Data Source & Variables

Candidate orthopaedic procedures were identified from the ACGME Orthopaedic Surgery Case Log,[14] which defines case categories across all orthopaedic subspecialties. Most orthopaedic codes fall within the primary musculoskeletal CPT range (20000–29999); additional subspecialty codes outside this range were also included for hand and soft-tissue reconstruction (14000–15758), vascular repair (35045–35266), spinal decompression/fusion (63001–63086), and peripheral-nerve repair (64718–64911).[15]

Using the 2023 CMS Medicare Physician & Other Practitioners Public Use File, eligible procedures (reported to CMS as HCPCS Level I/CPT codes[16]) were ranked by total facility services (Tot_Srvcs), and the 20 most frequently billed were selected; their reimbursement was then evaluated retrospectively from 2013 to 2023. Records designated as non-facility place of service were excluded.[17]

For each procedure, the annual national Medicare professional payment in the facility setting was obtained from the CMS Physician Fee Schedule Look-Up Tool (Medicare Administrative Contractor locality 0000000) for 2013–2023;[18,19] these amounts reflect the physician fee schedule payment, not the hospital or ambulatory surgery center facility fee. Payments were adjusted to 2023 U.S. dollars using the Consumer Price Index for All Urban Consumers (CPI-U), selected to reflect general purchasing power and to permit comparison with prior reimbursement studies.[20] The inflation-adjusted payment was calculated as nominal payment × (2023 CPI-U /

Table 1: Current Procedural Terminology (CPT) linear regression results for all 20 most performed orthopaedic procedures including slope ($/year), P values, absolute change, percent change, utilization rates, and CAGR (%). Procedures sorted by 2023 utilization.

CPT Code	Procedure	2023 Utilization	2013 IAFP ($)	2023 IAFP ($)	Annual Change ($/year)	CAGR (%)	Absolute Change ($)	Percent Change (%)	p Value
27447	Primary Total Knee Arthroplasty	560,785	2031.04	1299.57	−60.26	−4.37	−731.47	−36.0	<0.001
27130	Primary Total Hip Arthroplasty	311,625	1902.42	1300.93	−54.26	−3.73	−601.49	−31.6	<0.001
64721	Carpal Tunnel Release	144,257	566.94	447.31	−11.11	−2.34	−119.63	−21.1	<0.001
26055	Trigger Finger Release	131,015	413.41	300.24	−11.36	−3.15	−113.17	−27.4	<0.001
29827	Arthroscopic Shoulder Rotator Cuff Repair	118,710	1420.92	1086.08	−31.39	−2.65	−334.84	−23.6	<0.001
27245	Hip Cephalomedullary Nail Insertion	95,799	1625.19	1243.32	−37.32	−2.64	−381.87	−23.5	<0.001
29826	Arthroscopic Shoulder Subacromial Decompression	87,817	230.96	173.16	−5.80	−2.84	−57.80	−25.0	<0.001
27236	Hip Hemiarthroplasty	74,837	1580.69	1209.77	−36.17	−2.64	−370.92	−23.5	<0.001
28285	Hammertoe Deformity Correction	72,491	498.86	389.03	−10.74	−2.46	−109.83	−22.0	<0.001
29823	Arthroscopic Shoulder Debridement Involving 3+ Structures	66,247	833.06	605.90	−21.80	−3.13	−227.16	−27.3	<0.001
29848	Endoscopic Carpal Tunnel Release	60,739	676.42	524.57	−14.60	−2.51	−151.85	−22.4	<0.001
29881	Arthroscopic Knee Meniscectomy (Medial or Lateral Compartment)	54,082	721.36	553.38	−15.99	−2.62	−167.98	−23.3	<0.001
29824	Arthroscopic Shoulder Distal Clavicle Excision	52,196	899.82	691.98	−19.28	−2.59	−207.84	−23.1	<0.001
29880	Arthroscopic Knee Meniscectomy (Medial and Lateral Compartments)	41,549	749.40	574.73	−16.74	−2.62	−174.67	−23.3	<0.001
29828	Arthroscopic Shoulder Biceps Tenodesis	39,655	1222.89	931.56	−27.47	−2.68	−291.33	−23.8	<0.001
27487	Revision Total Knee Arthroplasty	26,341	2320.74	1771.96	−53.79	−2.66	−548.78	−23.6	<0.001
28820	Toe Ray Amputation	25,271	535.35	178.92	−38.23	−10.38	−356.43	−66.6	<0.001
27446	Unicompartmental Knee Arthroplasty	23,687	1459.19	1163.35	−32.49	−2.24	−295.84	−20.3	<0.001
26160	Hand or Digit Tendon Sheath or Joint Capsule Lesion Excision	21,093	443.68	325.66	−11.83	−3.05	−118.02	−26.6	<0.001
26480	Flexor Tendon Transfer (Forearm/Wrist)	19,272	994.60	810.58	−14.56	−2.03	−184.02	−18.5	<0.001

IAFP, inflation-adjusted facility-setting payment; CAGR, compound annual growth rate. Payments are Medicare professional payments in the facility setting, in 2023 U.S. dollars (CPI-U adjusted).

CPI-U for the corresponding year). These inflation-adjusted values are reported throughout as the inflation-adjusted facility-setting payment (IAFP).

The authors' institution determined that this secondary analysis of publicly available, de-identified data was exempt from institutional review board review.

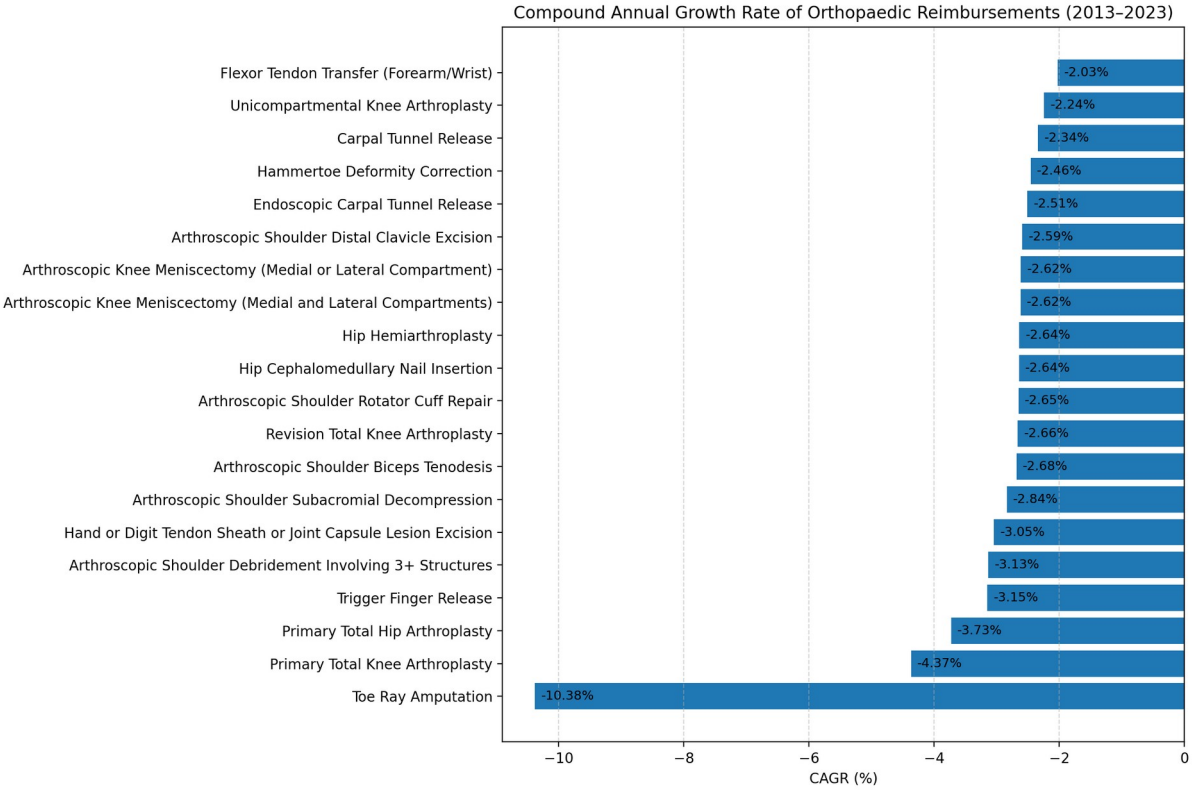
Data Analysis

All statistical analyses were conducted in Python (version 3.13.7) using the pandas, NumPy, SciPy, matplotlib, and statsmodels packages. Annual trends in each procedure's IAFP from 2013 to 2023 were estimated using separate linear regression models, with the p-value testing whether the annual slope differed from zero; slopes, p-values, 95% confidence intervals (CI), and CAGR were calculated for each CPT code (Table 1). Aggregate annual mean payments across all 20 procedures were also assessed using linear regression (Figure 1). Because the distribution of paired payment changes was not assumed to be normal, 2013 and 2023 payments were compared using the Wilcoxon signed-rank test. The compound annual growth rate (CAGR) was calculated for each procedure as $CAGR = [(2023\ IAFP / 2013\ IAFP)^{1/10} - 1] \times 100$. Statistical significance was defined as $p < 0.05$.

RESULTS

Linear regression showed consistent downward trends across all 20 orthopaedic procedures during the study period. Estimated annual changes ranged from −$60.26 to −$5.80, with a mean decline of $26.26 per year across the 20 procedures (Figure 1). Reimbursement ranged from $231 to $2,321 in 2013 and from $173 to $1,771 in 2023. The lowest 2023 value corresponded to arthroscopic shoulder subacromial decompression and the highest to revision total knee arthroplasty. The two procedures with the largest absolute decreases

Figure 2: Compound annual growth rates (CAGR) for inflation-adjusted Medicare reimbursement across the 20 most commonly performed orthopaedic procedures from 2013 to 2023. All procedures demonstrated negative CAGR values, indicating consistent annual decreases in reimbursement over the study period.



over the study period were primary total knee arthroplasty (TKA), which fell from $2,031.04 to $1,299.57 (−36.0%), and primary total hip arthroplasty (THA), which fell from $1,902.42 to $1,300.93 (−31.6%); toe ray amputation showed the largest relative decrease, falling from $535.35 to $178.92 (−66.6%) (Figures 3–5).

CAGR values were uniformly negative across all 20 procedures (Figure 2). The largest annual percentage declines occurred in toe ray amputation (−10.38%), TKA (−4.37%), and THA (−3.73%); the smallest occurred in carpal tunnel release (−2.34%), unicompartmental knee arthroplasty (−2.24%), and flexor tendon transfer (−2.03%). When compared using the Wilcoxon signed-rank test, 2023 reimbursements were significantly lower than 2013 reimbursements across the selected procedure set, with a median paired decline of $217.50 (IQR, $143.79–$360.05; $p < 0.0001$).

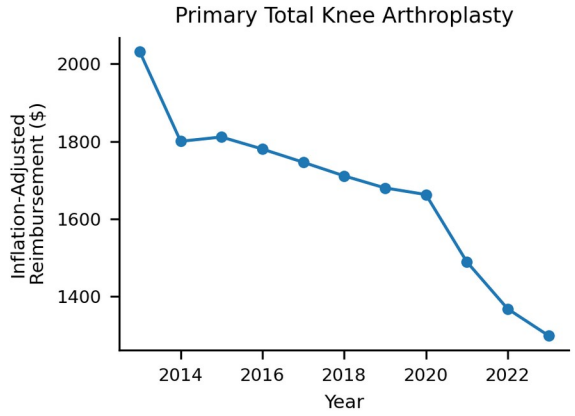
DISCUSSION

This study found consistent declines in inflation-adjusted Medicare professional payments across the 20 most frequently billed facility-based orthopaedic procedures from 2013 to 2023. These findings extend prior reports of declining reimbursement within sports medicine, adult reconstruction, and other orthopaedic subspecialties.[10-13] Primary TKA and THA demonstrated the largest absolute payment declines, whereas toe ray amputation demonstrated the largest relative decline. Changes in the Medicare conversion factor, which has fallen from a peak of $38.2581 in 2001 to $33.8872 in 2023 without automatic adjustment for inflation, likely contributed to the overall trend, although procedure-specific payments are also affected by changes in relative value units and other components of the Physician Fee Schedule.[21]

Similar declines have been observed across surgical specialties. Sibia et al. reported that inflation-

adjusted national expenditures for physician services rose 33.9% from 2013 to 2021, while compensation for the most common procedures in each surgical specialty declined by a mean of 22.8% from 2013 to 2023, ranging from −2.2% in urology to −27% in general surgery; orthopaedic procedures declined 24.7%.[22] Declining real reimbursement therefore appears to reflect a broader divergence between healthcare expenditures and professional payment rather than a phenomenon unique to orthopaedics.

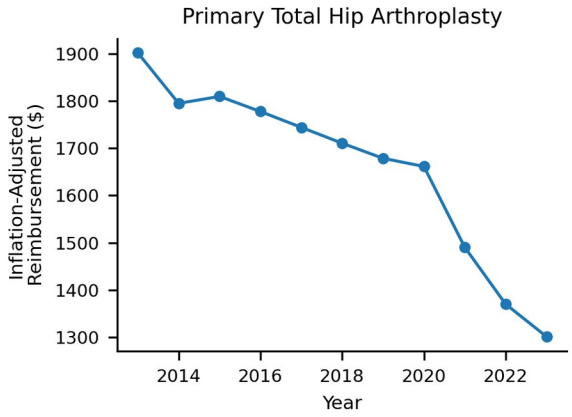
Figure 3: Inflation-adjusted Medicare reimbursement for primary total knee arthroplasty (TKA) from 2013 to 2023, demonstrating an absolute decrease of $731 over the study period.



The widening gap between practice costs and professional reimbursement may create challenges for maintaining access to Medicare-funded surgical care. Catton et al. projected that inflation-adjusted hourly professional reimbursement for primary and revision hip and knee arthroplasty could fall below $100 by 2030.[23] Although such projections should be interpreted cautiously, they illustrate the potential magnitude of continued reimbursement erosion.

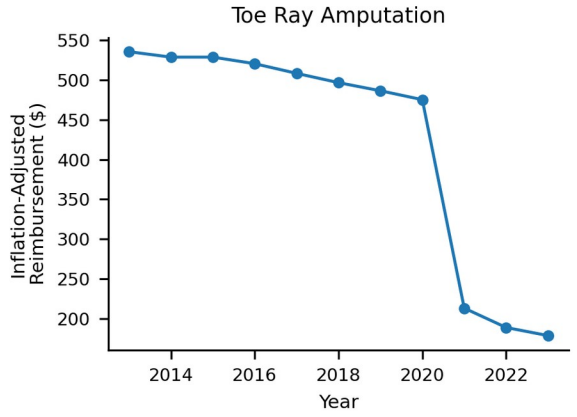
Declining real reimbursement may also affect physician participation and patient access, although the present study did not evaluate that relationship directly. Cantor et al. found that physicians in nonmetropolitan and health-professional-shortage counties were more likely to leave Medicare despite an overall increase in participating physicians from 2013 to 2023.[24] Separate studies have reported increasing Medicare opt-out rates among arthroplasty surgeons and across physician specialties.[25,26] Together, these findings raise concern that continued reimbursement declines could disproportionately affect access in already underserved markets, although further study is needed to determine whether reimbursement trends directly influence participation.

Figure 4: Inflation-adjusted Medicare reimbursement for primary total hip arthroplasty (THA) from 2013 to 2023, demonstrating an absolute decrease of $601 over the study period.



This study has several limitations. First, the analysis was limited to Medicare professional payments and did not include private-payer reimbursement, preventing assessment of the broader payer gap. Second, the study did not evaluate whether reimbursement changes were associated with procedure utilization, physician participation, patient access, or clinical outcomes; such consequences cannot be inferred from these data. Third, the procedure sample was defined by the 20 most frequently billed facility-based procedures in 2023, which may exclude procedures that were common earlier in the study period and may not represent all orthopaedic procedures, subspecialties, or practice settings. Use of national payment amounts also precluded assessment of regional variation. Future studies should integrate utilization, private-payer, geographic, and physician-participation data to evaluate the practical effects of declining reimbursement.

Figure 5: Inflation-adjusted Medicare reimbursement for toe ray amputation from 2013 to 2023, demonstrating an absolute decrease of $356 over the study period.



CONCLUSION

Inflation-adjusted Medicare professional payments declined consistently from 2013 to 2023 across the 20 most frequently billed facility-based orthopaedic procedures, demonstrating continued erosion in the real value of Medicare reimbursement across orthopaedic subspecialties. Further research incorporating procedure utilization, private-payer reimbursement, physician participation, and geographic variation is needed to determine whether these financial trends affect access to orthopaedic care.

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