

Inflation-Adjusted Medicare Reimbursement for Hip Arthroscopy Fell by 21.1% on Average Between 2011 and 2022



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Purpose: To examine Medicare reimbursement for hip arthroscopy from 2011 to 2022. **Methods:** The seven most common procedures performed with hip arthroscopy by a single surgeon were gathered. The Physician Fee Schedule Look-Up Tool was utilized to access financial data of the associated Current Procedural Terminology (CPT) codes. The reimbursement data for each CPT were gathered from the Physician Fee Schedule Look-Up Tool. With the consumer price index database and inflation calculator, reimbursement values were adjusted for inflation to 2022 U.S. dollars. **Results:** Following an adjustment for inflation, it was found that reimbursement rate for hip arthroscopy procedures on average was 21.1% lower between 2011 and 2022. The average reimbursement per CPT code for the included codes was \$899.21 in 2022 compared to inflation adjusted \$1,141.45 in 2011, a difference of \$242.24. **Conclusions:** From 2011 to 2022, the average inflation-adjusted Medicare reimbursement has steadily declined for the most common hip arthroscopy procedures. As Medicare is one of the largest insurance payers, these results have substantial financial and clinical implications for orthopaedic surgeons, policy makers, and patients. **Level of Evidence:** Level IV, economic analysis.

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Introduction

The United States health care system comprises private and public payers and involves a complex billing process. Physician billing coding sets, such as the Current Procedural Terminology (CPT), enable standardization of medical nomenclature to assess appropriate reimbursement. Each CPT code has an associated total relative value unit (RVU), which is based on required technical skill and training, practice expenditure, and anticipated malpractice expenses.¹ Each RVU value is decided by 31 physicians in the Relative Value Scale Update Committee² and is adjusted for geographic cost variations, as well as an applied monetary conversion factor that determines the final reimbursement rate.³

As one of the largest payers in the U.S. system, Medicare is the insurer for over 61 million Americans.⁴ Given its complexity, assessment and understanding of trends in Medicare reimbursement provide valuable information to patients, physicians, and insurance companies. Recent studies across a variety of specialties have analyzed trends in payment and have noted a tendency toward decreasing reimbursement rates as a means of controlling rising healthcare costs.^{5–15}

In particular, hip arthroscopy is becoming an increasingly common treatment for femoroacetabular

impingement syndrome and labral tears given the high rates of patient satisfaction, favorable functional outcomes, and low rates of complications.^{16,17} Labral degeneration is graded by the Seldes classification, which evaluates the extent and type of disruption of the rim of fibrocartilage surrounding the acetabulum.¹⁸ After diagnostic evaluation of intra- and extra-capsular structures, labral tears are treated with repair, which involves anchoring torn tissue back to the acetabular rim. If the tear is calcified or irreparable, a debridement, augmentation, or reconstruction may be performed instead.^{19,20} An assessment of the surrounding soft tissue structures, including the ligamentum teres, chondrolabral junction, and acetabular cartilage, is performed to determine other operative procedures.

Despite its increasing popularity, there remains limited literature on reimbursement trends in hip arthroscopy. The purpose of this study was to examine in Medicare reimbursement for hip arthroscopy from 2011 to 2022. It was hypothesized that there would be a significant decrease in Medicare reimbursement over the past 11 years for included hip arthroscopic procedures.

Methods

This study was performed at the American Hip Institute Research Foundation. This study was performed in accordance with the ethical standards in the 1964 Declaration of Helsinki. This study was carried out in accordance with relevant regulations of the US Health Insurance Portability and Accountability Act (HIPAA). Details that might disclose the identity of the subjects under study have been omitted. This study was approved by the Institutional Review Board. (IRB ID: 5276)

An analysis was conducted of the most common hip arthroscopy procedures performed at a high-volume hip arthroscopy center (A.H.I.), with any unlisted procedure being excluded. Seven CPT codes were included: 29916 (labral repair), 29862 (chondroplasty, abrasion arthroplasty and/or resection of labrum), 29915 (acetabuloplasty), 29914 (femoroplasty), 29861 (loose body removal), 29860 (diagnostic hip arthroscopy/synovial biopsy), and 29863 (synovectomy/lysis of adhesions).

The Physician Fee Schedule Look-Up Tool²¹ was used to access financial data of the included CPT codes. From January 2011 (when modern hip arthroscopy codes entered the fee schedule) to June 2022, the pricing information was averaged for each procedural code, including all geographic locations and all Medicare Administrative Contractors. To assess for inflation, the most recent consumer price index (CPI) data was accessed from the U. S. Department of Labor, Bureau of Labor Statistics²² database. The average CPI values for the first half of 2022 and the first half of 2011 were

retrieved from the database, and a percent change was calculated. The CPI is the measure of the average change over time in prices paid for goods and services and is the most commonly used estimate of the U.S. inflation rate. An adjustment was made to account for inflation by using the raw CPI data with the CPI Inflation Calculator.²³ After adjusting for inflation, the average yearly, percent change, and adjusted R-squared values were calculated. In regression models, R-squared values represent the proportion of variance observed in the dependent variable explained by the independent variable.²⁴ An average across all procedures was also calculated. Using adjusted values in 2022 U.S. dollars, the compound annual growth rate (CAGR) was calculated to measure for change over time and is used in economics to output a constant rate of return for investments.²⁵ The following formula was used:

$$CAGR = \left(\frac{2022 \text{ Value}}{2011 \text{ Value}} \right)^{1/(2022-2011)} - 1$$

More specifically, the mean annual growth rate over a time period is calculated by taking the *n*th root of the total return, where *n* is the number of years in the selected time period. This formula provides a smoothing effect on an annually compounding value, thus yielding a more accurate evaluation over time compared to other methods like simple arithmetic rate of return.

R v 4.1.1. was used for all statistical analysis and calculations. Because all analyses used only publicly available data, Institutional Review Board approval was not required for this study.

Results

The average unadjusted reimbursement rate for included hip arthroscopy procedures increased by 1.8%. However, the CPI during this time frame also rose by 29.0%, which was significantly greater than the unadjusted change in hip arthroscopy procedure reimbursement [$P < .001$ (Table 1)]. Following an adjustment for inflation, it was found that reimbursement rate and CAGR declined by 21.1% and 0.10%, respectively, between 2011 and 2022 for included hip arthroscopy procedures. The average reimbursement per CPT code for the included codes was \$899.21 in 2022 compared to inflation adjusted \$1,141.45 in 2011, a difference of \$242.24. In this timeframe, the yearly change for adjusted average reimbursement rate was -1.9%, while the CAGR was -0.01%.

All included CPT codes in this analysis showed a decline in reimbursement after rates were adjusted for inflation. The change in reimbursement was similar across all included procedures, but hip arthroscopy chondroplasty and/or labral debridement (29862), showed the lowest decline of 19.4% while femoroplasty (29914), showed the greatest decline

Table 1. Unadjusted Medicare Reimbursement for the Seven Included Hip Arthroscopy Procedures Between 2011 and 2022

CPT Code	Description of Procedure	Mean Reimbursement in 2011 (2011 USD)	Mean Reimbursement in 2022 (2022 USD)	Unadjusted Percent Change Mean Reimbursement from 2011 to 2022
29916	Hip arthroscopy; Labral repair	\$1,062.31	\$1,062.63	0.03%
29862	Hip arthroscopy; chondroplasty and/or labral debridement	\$819.09	\$851.43	3.95%
29915	Hip Arthroscopy; Acetabuloplasty	\$1,062.31	\$1,069.52	0.68%
29914	Hip Arthroscopy; Femoroplasty	\$1,042.67	\$1,039.96	-0.26%
29861	Hip Arthroscopy; Loose body removal	\$729.78	\$750.18	2.80%
29860	Hip Arthroscopy; Diagnostic with or without synovial biopsy	\$663.18	\$672.55	1.41%
29863	Hip Arthroscopy; Synovectomy/lysis of adhesions	\$816.59	\$848.18	3.87%
Average		\$885.13	\$899.21	1.78%

CPT, Current Procedural Terminology, USD, U.S. dollars.

of -22.7%. Table 2 contains the average adjusted Medicare reimbursement for included hip arthroscopy procedures.

For the included hip arthroscopy procedures, the average R-squared regression value was 0.874, representing a strong linear decline of inflation-adjusted reimbursement rates across the time period (Fig 1). Across the examined years, the steepest decline occurred between 2021 and 2022, which was -7.7% when averaged across all procedures (Fig 2). The only one-time period where the average reimbursement rate was positive occurred between 2018 and 2019, with 0.1% rise.

For the time ranges of 2011 to 2016 and 2016 to 2020, a subanalysis was performed to analyze any differences in the percent change of the inflation adjusted average reimbursement rate. It was found that reimbursement fell 5.3% and 5.3% between 2011 and 2016 and between 2016 to 2020, respectively.

Discussion

Our analysis of inflation-adjusted Medicare reimbursement rates for hip arthroscopy revealed a 21.1% decrease from 2011 to 2022. The average reimbursement increased by 1.8% but lagged behind the increase of CPI of 29.0%. The average CAGR, which accounts for value fluctuations year to year, declined by 0.10%. Thus, our results indicate a steady fall in value in the time period, as overall value is not necessarily impacted by inflation. Notably, the greatest decline was observed in the most commonly performed procedures: labral

repair, femoroplasty, and acetabuloplasty. These findings support our hypothesis that there would be a significant decrease in Medicare reimbursement over the past 11 years for the included hip arthroscopic procedures.

Orthopaedic procedures have become significantly more common, with an increase in Medicare utilization rate of 41% from between 2000 and 2010.⁷ A decrease in reimbursement despite increase in surgical volume is not unique to hip arthroscopy and has been observed with other orthopaedic procedures.^{26,27} For arthroscopic partial meniscectomy, LaPrade et al.²⁸ found that from 2005 to 2014, increasing hospital reimbursement outpaced declining surgeon reimbursement by 365%. They hypothesized drivers of this gap included material overhead, hospital administration, and devaluation of the CPT analyzed in the study. Mayfield et al.⁹ noted a change in total joint replacement Medicare reimbursement by an average of -1.7% per year, similar to the -1.9% per year observed for hip arthroscopy in this study. Conversely, there was a 19% increase in primary total joint arthroplasty volume.²⁹ Walker et al.³⁰ observed that the RVU decreased across all orthopaedic subspecialties by ~40%, with reimbursement decreasing by 29%. These studies speculated the growing health care spending is more likely to be driven by increasing expenditures from number and complexity of procedures, as well as rising hospital charges.^{29,30} Hip arthroscopy is considered a high-cost procedure due to expensive equipment costs and technologies involved. The recent rise in popularity of

Table 2. Adjusted Medicare Reimbursement for the Seven Included Hip Arthroscopy Procedures Between 2011 and 2022

CPT Code	Description of Procedure	Inflation Adjusted Mean Reimbursement in 2011 (2022 USD)	Mean Reimbursement in 2022 (2022 USD)	Inflation Adjusted Percent Change Mean Reimbursement from 2011 to 2022	CAGR	RSQ
29916	Hip arthroscopy; Labral repair	\$1,305.16	\$1,062.63	-22.43%	-0.08%	0.905
29862	Hip arthroscopy; Chondroplasty and/or labral debridement	\$1,006.34	\$851.43	-19.39%	-0.11%	0.876
29915	Hip Arthroscopy; Acetabuloplasty	\$1,305.16	\$1,069.52	-21.93%	-0.08%	0.9105
29914	Hip Arthroscopy; Femoroplasty	\$1,281.03	\$1,039.96	-22.66%	-0.09%	0.922
29861	Hip Arthroscopy; Loose body removal	\$896.62	\$750.18	-20.29%	-0.12%	0.862
29860	Hip Arthroscopy; Diagnostic with or without synovial biopsy	\$814.79	\$672.55	-21.36%	-0.13%	0.776
29863	Hip Arthroscopy; Synovectomy/lysis of adhesions	\$1,003.26	\$848.18	-19.45%	-0.11%	0.863
Average		\$1,141.45	\$899.21	-21.07%	-0.10%	0.874

Of note, CPI was used to adjust for inflation. CPT, Current Procedural Terminology; CAGR, compound annual growth rate; RSQ, R squared.

arthroscopic hip surgery could contribute to increased healthcare expenditures and be a factor in reduced reimbursement that was observed in our study.

Previous studies have speculated that the decrease in reimbursement rates observed across multiple specialties is, in part, due to historical congressional policies.^{8,11,30} In other words, the more cases that were done, the less physicians were paid. The Balanced Budget Act of 1997³¹ was enacted to curtail Medicare expenditures through a metric known as the sustainable growth rate (SGR), which served to adjust the conversion factor for Medicare reimbursement. Reimbursement was adjusted on the basis of the rate of physician spending compared to annual changes in the gross domestic product per capita, with excess spending decreasing the SGR and consequently leading to lower reimbursement rates. Since 2003, the use of the SGR-calculated spending targets led to several scheduled rapid cuts in payments, which Congress later overturned with “Doc Fix” acts. The use of the sustainable growth rate was repealed with the Medicare Access and CHIP Reauthorization Act of 2015.³² However, our subanalysis shows that the decline in reimbursement rates were comparable between 2011 and 2016 vs. between 2016 and 2020, indicating a steady decline that cannot be attributable to the Balanced Budget Act alone. As techniques and implants in the field of hip arthroscopy have developed over time, the costs associated with the surgery also increased. Although the Balanced Budget Act was repealed, the increased cost

burden of hip arthroscopy may still have presented an avenue for decreased reimbursement. In addition, as more surgeons are trained in this relatively new field,

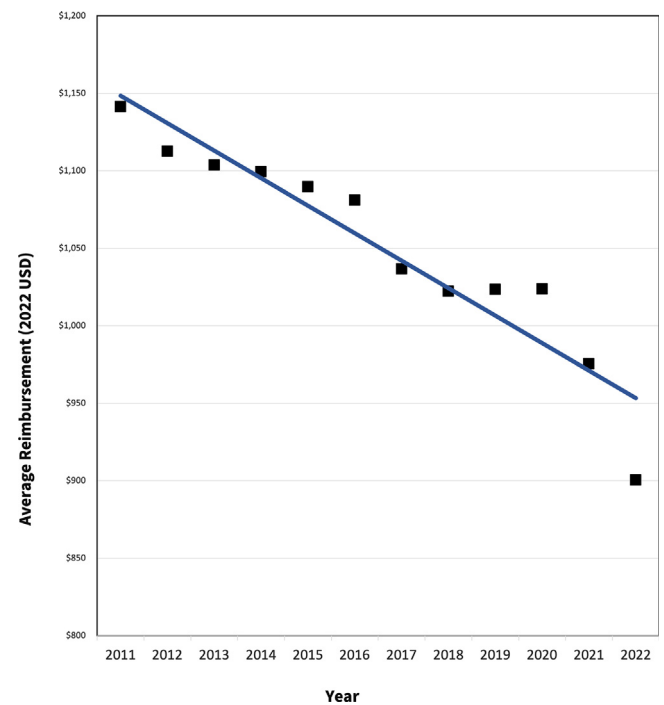


Fig 1. An inflation-adjusted annual analysis of average change in Medicare reimbursement for the most common hip arthroscopy procedures.

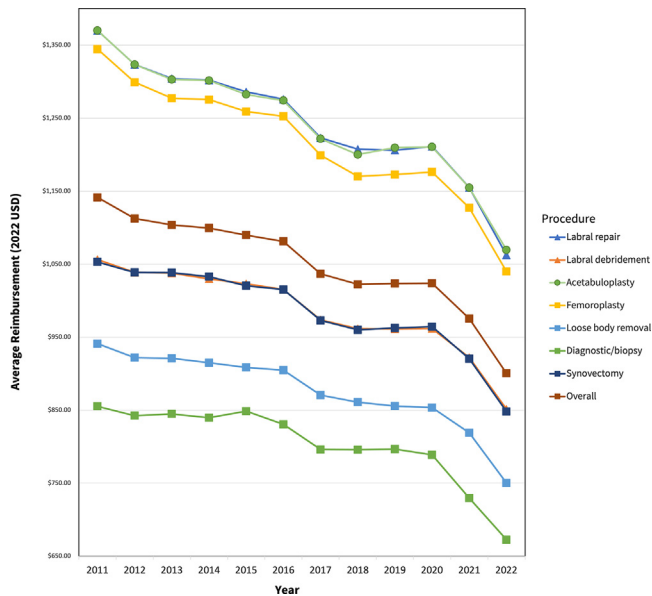


Fig 2. An inflation-adjusted annual analysis of change in Medicare reimbursement for hip arthroscopy procedures with each procedural code illustrated separately.

surgical efficiency and volume have both increased over time, policies that incentivize value over volume may contribute to falling reimbursement. In our study, the largest decrease in reimbursement was observed in the most commonly performed procedures (femoroplasty, labral repair, and acetabuloplasty), which supports this theory.

With rising healthcare costs, there has become increasing emphasis on balancing cost containment with maintaining access to high-quality care. These findings raise concerns about the potential for a development in worsening disparities in access to care. Even though hip arthroscopy is an elective procedure with a relatively younger patient population, declining Medicare reimbursement is of concern because many private insurers and Medicaid reimburse as a percentage of Medicare. Given the decreasing reimbursement along with increasing practice expenses, surgeons may opt to either ration care or decline to treat Medicare patients in order to ensure practice survival. Alternatively, smaller practices that treat Medicare patients may merge out of necessity, and inflation outpacing reimbursement further drives this consolidation of healthcare system. Previous studies have identified consequences of healthcare consolidation at the local³³ and national³⁴ levels. Larger groups may incentivize operative efficiency and turnover, but also can decrease patient and physician autonomy. Consolidation of practices has led to an increase of administrative costs³⁵ that also raise cost of care, which contributes to financial barriers in patient access to care. Insurance status

has already been shown to significantly influence access to orthopaedic care, with providers accepting a smaller proportion of Medicare patients compared to those with private insurance.^{36,37} Insurance status also affects quality of care as Veltre et al. noted that Medicare patients had a higher rate of mortality and surgical complications after total hip and total knee arthroplasty.^{38,39} Regarding our study, there is a lack of codification of certain procedures commonly performed in hip arthroscopy like capsular plication, labral reconstructions, labral augmentations, and iliopsoas tenotomy. Some surgeons may not perform these unlisted procedures because of decreased reimbursement, which can lead to worse patient outcomes and demonstrates the inherent limitations of our current reimbursement system. Evidence showing that orthopaedic surgery payments are decreasing at a faster rate for Medicare compared to commercial insurance may further serve to exacerbate this disparity.⁴⁰ This is a particular concern given the backlog of orthopaedic cases, resulting from the COVID-19 pandemic.^{41–43} Surveys indicated that more than 90% of orthopaedic surgeons reported stopping or delaying elective surgeries because of COVID-19, with a similar decrease in volume of surgical cases and surgeon revenue.^{44–47} Our study demonstrates the need for strategies to ensure adequate access and high-quality care for hip arthroscopy patients in light of declining reimbursement and increasing inflation. This issue is complex and multifactorial; however, there are strategies that can mitigate these issues. For example, policies could be put into place that protect patients from substitution of expensive equipment for inferior but cheaper alternatives. Alternatively, investing in the research and development of more affordable equipment options without sacrificing quality and patient outcomes is a potential solution. Practices can increase patient access by ensuring that declining reimbursement does not shift the financial burden to the patient by decreasing excessive administrative spending. As more hip arthroscopy surgeons are trained and the procedure becomes more popular, market pressures may further decrease reimbursement and may prohibit access for patients that cannot afford surgery. On a larger scale, political advocacy for increased financial incentives for seeing Medicare patients may be necessary as reimbursement continues to drop and healthcare disparities widen. This may involve complex changes to the multipayer insurance system. Although these findings regarding the declining rate of reimbursement for hip arthroscopies are concerning, they provide greater transparency on this issue and allow avenues for physicians, policy makers, insurers, and other stakeholders to advocate for stabilization in reimbursement in order to ensure continued equitable patient care.

Limitations

This study has several limitations. First, the most common procedures performed were selected from the database of a single high-volume hip arthroscopy center, which may not be generalizable. This study only analyzed the seven most commonly performed hip arthroscopy procedures; however, interventions such as labral reconstruction, labral augmentation, capsular repair/capsular plication, capsular release, iliopsoas tenotomy, and other extra articular hip procedures were not included because they are unlisted codes. Next, this study is an analysis of the Medicare reimbursement database and does not provide a representative view of payments from private insurance or patients paying out of pocket. Additionally, this study did not evaluate expenditure and hospital costs over the selected time period to correlate with reduced reimbursements. Finally, it is likely that there are other confounding factors that influenced reimbursement rate that could not be accounted for in our statistical analysis.

Conclusion

From 2011 to 2022, the average inflation-adjusted Medicare reimbursement has steadily declined for the most common hip arthroscopy procedures. As Medicare is one of the largest insurance payers, these results have substantial financial and clinical implications for orthopaedic surgeons, policy makers, and patients.

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