

ORIGINAL ARTICLE

Trends in Medicare utilization and reimbursement for hematology/oncology procedures from 2012 to 2023: A geriatric oncology perspective

J. Conic¹  | T. Reske²

¹Department of Internal Medicine, Section of Geriatric Medicine, Louisiana State University Health Sciences Center, New Orleans, Louisiana, USA

²Department of Internal Medicine, Section of Geriatric Medicine and Section of Hematology/Oncology, Louisiana State University Health Sciences Center, New Orleans, Louisiana, USA

Correspondence

J. Conic, Department of Internal Medicine, Section of Geriatric Medicine, Louisiana State University Health Sciences Center, New Orleans, LA, USA.
Email: julijanaconic@gmail.com

Abstract

Objectives: Given the scarcity of data exploring reimbursement trends in the field of hematology/oncology, we sought to characterize these trends for common procedures in this field from 2012 to 2023.

Methods: Using the Centers for Medicare and Medicaid Services' Physician Fee Schedule Look-Up Tool we collected reimbursement data for 40 hematology/oncology procedure codes from 2012 to 2023. Data was adjusted to 2023 United States (US) dollars using the Consumer Price Index (CPI).

Results: From 2012 to 2023 gross reimbursement for the facility price decreased 4.4% and increased 9.2% for the non-facility price. When adjusted for inflation, compensation decreased 96.1% and 96.6%, respectively. None of the 40 examined Current Procedural Terminology (CPT) codes increased in net reimbursement over the study period.

Conclusions: Medicare reimbursement for common hematology/oncology procedures decreased from 2012 to 2023. Further research is necessary to explore the implications of these trends on the delivery of patient care.

KEYWORDS

geriatric, health systems, hematology, Medicare, oncology, physician reimbursement

1 | INTRODUCTION

Medicare Part B is federal health insurance coverage for persons over the age of 65 and those with disabilities that covers physician services and prescription medications in the United States. The covered medications include intravenous and injectable antineoplastic chemotherapeutics such as traditional chemotherapies, immunotherapies, targeted monoclonal antibodies, and oral medications such as capecitabine. Medicare Part B is distinct from Medicare Part A which covers hospitalizations. Enrollment in Medicare Part A is

automatic for those meeting citizenship and residency requirements and generally does not have a monthly premium, while beneficiaries of Medicare Part B pay a monthly premium that is standardized for each year, but subject to change based on income and period of enrollment. Physicians and their practices may choose whether to participate in Medicare. If they chose to participate, they must accept Medicare's approved amount, which is 80% of what Medicare pays plus a 20% copayment that the patient is responsible for.¹

It is estimated that the national cancer attributed medical care costs in 2015 were \$183 billion and projected to increase 34% to

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\$246 billion by 2030 based solely on population growth.² US health care spending on cancer drugs grows approximately 12% to 15% annually, fueled by recent breakthroughs in cancer therapeutics. This unsustainable growth has become the topic of federal reform proposals.³ In addition to medications, Medicare Part B covers physician services under the Physician Fee Schedule (PFS) which is updated annually to maintain budget neutrality. For any given procedure or service, as defined by their designated CPT code, payment is dictated by multiple considerations that are further discussed in the methods section including a conversion factor that changes annually. Notably, as a result of the expiration of the 3% payment increase provided by Congress in 2022, the conversion factor was decreased 4.47% from 2022 to 2023, resulting in advocacy from major medical associations such as the American Association of Medical Colleges (AAMC), the American College of Physicians (ACP), and the American Society of Clinical Oncology (ASCO), for congressional leaders to cease such cuts to Medicare spending.⁴⁻⁶

Previous studies have examined reimbursement trends in surgical and radiation oncology and found notable decreases in most of the procedure codes evaluated.⁷⁻⁹ However, to the author's best knowledge, no study to date has evaluated the reimbursement of physicians through the PFS for procedures in hematology/oncology. The aim of this study was to evaluate the trends in reimbursement for hematology/oncology procedures between 2012 to 2023 as decreases in reimbursement rates could have implications for the accessibility of hematology/oncology services and sustainability of these practices.

2 | MATERIALS AND METHODS

Under the PFS, for any given procedure or service, as defined by CPT code, payment is dictated by the Relative Value Units (RVU), the Geographic Practice Cost Index (GCPI), which adjusts for geographic variation in the cost of care, and finally a conversion factor to convert RVUs to dollars. Additionally, each code's allocated RVU has three components: (1) work time and intensity, (2) practice expense and overhead, and (3) malpractice insurance.¹⁰

The data analyzed were extracted from the Physician Fee Schedule Look-Up Tool for each year (2012 to 2023) and CPT code of interest.¹⁰ CPT codes were obtained from the Medicare Coverage Database.¹¹ The codes were selected by the authors to represent common procedures in the field of medical oncology and hematology (Table 1). The following CPT codes were extracted: antineoplastic chemotherapy administration (96405, 96406, 96401, 96409, 96411, 96413, 96415, 96416, 96417, 96420, 96422, 96423, 96425, 96440, 96446, 96450, 96542), antineoplastic hormone therapy administration (96402), non-chemotherapy infusion (96360, 96361, 96365, 96366, 96367, 96368, 96369, 96370, 96371, 96372, 96373, 96374, 96375, 96376), bone marrow sampling (38220, 38221, 38222), bone marrow harvest (38230, 38232), and bone marrow transplant (38240, 38241, 38242). For

TABLE 1 Commonly billed CPT codes in hematology/oncology.

CPT Code	Code description
38220	Diagnostic bone marrow; aspiration/aspirations
38221	Diagnostic bone marrow; biopsy/biopsies
38222	Diagnostic bone marrow; biopsy/biopsies or aspiration/aspirations
38230	Bone marrow harvesting for transplantation, allogenic
38232	Bone marrow harvesting for transplantation, autologous
38240	Transplantation of allogenic peripheral stem cells
38241	Transplantation of autologous peripheral stem cells
38242	Allogenic donor lymphocyte infusion
96360	Intravenous infusion, hydration; initial, 31 min to 1 h
96361	Intravenous infusion, hydration; each additional hour
96365	Intravenous infusion, for therapy, prophylaxis, or diagnosis (specify substance or drug); initial, up to 1 h
96366	Intravenous infusion, for therapy, prophylaxis, or diagnosis (specify substance or drug); each additional hour
96367	Intravenous infusion, for therapy, prophylaxis, or diagnosis (specify substance or drug); additional sequential infusion of a new drug/substance, up to 1 h
96368	Intravenous infusion, for therapy, prophylaxis, or diagnosis (specify substance or drug); concurrent infusion
96369	Subcutaneous infusion for therapy or prophylaxis (specify substance or drug); initial, up to 1 h, including pump set-up and establishment of subcutaneous infusion site(s)
96370	Subcutaneous infusion for therapy or prophylaxis (specify substance or drug); each additional hour
96371	Subcutaneous infusion for therapy or prophylaxis (specify substance or drug); additional pump set-up with establishment of new subcutaneous infusion site(s)
96372	Therapeutic, prophylactic, or diagnostic injection (specify substance or drug); subcutaneous or intramuscular
96373	Therapeutic, prophylactic, or diagnostic injection (specify substance or drug); intra-arterial
96374	Therapeutic, prophylactic, or diagnostic injection (specify substance or drug); intravenous push, single or initial substance/drug
96375	Therapeutic, prophylactic, or diagnostic injection (specify substance or drug); each additional sequential intravenous push of a new substance/drug
96376	Therapeutic, prophylactic, or diagnostic injection (specify substance or drug); each additional sequential intravenous push of the same substance/drug provided in a facility
96401	Chemotherapy administration, subcutaneous or intramuscular; non-hormonal antineoplastic

TABLE 1 (Continued)

CPT Code	Code description
96402	Chemotherapy administration, subcutaneous or intramuscular; hormonal antineoplastic
96405	Chemotherapy administration; intralesional, up to and including 7 lesions
96406	Chemotherapy administration; intralesional, more than 7 lesions
96409	Chemotherapy administration; intravenous, push technique, single or initial substance/drug
96411	Chemotherapy administration; intravenous, push technique, each additional substance/drug
96413	Chemotherapy administration, intravenous infusion technique; up to 1 h, single or initial substance/drug
96415	Chemotherapy administration, intravenous infusion technique; each additional hour
96416	Chemotherapy administration, intravenous infusion technique; initiation of prolonged chemotherapy infusion (more than 8 h), requiring use of a portable or implantable pump
96417	Chemotherapy administration, intravenous infusion technique; each additional sequential infusion (different substance/drug), up to 1 h
96420	Chemotherapy administration, intra-arterial; push technique
96422	Chemotherapy administration, intra-arterial; infusion technique, up to 1 h
96423	Chemotherapy administration, intra-arterial; infusion technique, each additional hour
96425	Chemotherapy administration, intra-arterial; infusion technique, initiation of prolonged infusion (more than 8 h), requiring the use of a portable or implantable pump
96440	Chemotherapy administration into pleural cavity, requiring and including thoracentesis
96446	Chemotherapy administration into the peritoneal cavity via indwelling port or catheter
96450	Chemotherapy administration, into CNS (e.g., intrathecal), requiring and including spinal puncture
96542	Chemotherapy injection, subarachnoid or intraventricular via subcutaneous reservoir, single or multiple agents

each procedure, the unadjusted total and annual percent change in reimbursement was calculated and averaged. The latest available data for the Consumer Price Index (CPI) obtained from the U.S. Department of Labor's Bureau of Labor Statistics was used to adjust reimbursement rates for cumulative inflation to 2023 U.S. dollars¹² (Table 2). R-squared values were computed to analyze the strength of the correlation between time and changes in reimbursement. We analyzed the facility rate, the rate when the service is performed in a facility (hospital, nursing home, or outpatient department), and the non-facility rate which is the payment rate for services performed in the office because some codes

TABLE 2 Cumulative and annual inflation adjustment.

Year	Annual	Cumulative
2012	2.1	26.8
2013	1.5	24.7
2014	1.6	23.2
2015	0.1	21.6
2016	1.3	21.5
2017	2.1	20.2
2018	2.4	18.1
2019	1.8	15.7
2020	1.2	13.9
2021	4.7	12.7
2022	8.0	8.0

Note: Cumulative and annual inflation adjustment between 2012 and 2022 for US dollars as extracted from the CPI.

selected were only reported in one of these settings. CPT codes 38230, 38232, 38240, 38241, and 38242, had only facility prices listed. CPT codes 38220, 38221, 38222, 96405, 96406, 96440, 96446, 96450, and 96542 had both facility and non-facility prices listed. The remaining codes had only non-facility prices listed. This research contains publicly available, non-patient level data and as such is considered non-human subjects research according to the Institutional Review Board (#6964) at LSU Health Sciences Center in New Orleans, Louisiana. The data was analyzed using R (version 4.2; R Foundation for Statistical Computing), and Microsoft Excel.

3 | RESULTS

Hematology/oncology CPT codes have decreased in nominal reimbursement for the facility price by 4.4% and increased 9.2% for the non-facility price. However, when adjusted for inflation, compensation decreased 96.1% and 96.6%, respectively. RVUs allocated per procedure have gone up from 2012 to 2023 with a sharp decrease in 2017, and an increase and plateau from 2018 to 2022. Our results revealed that over time, procedures are reimbursed less, despite being valued at higher RVUs overall when comparing 2012 to 2023 (Figures 1 and 2). Our findings suggest variable net increase and decrease in adjusted and nominal facility and non-facility price. The largest increase in the nominal non-facility price was 6.8% between 2021 and 2022. The largest decrease in the nominal non facility price was 5.4% between 2020 and 2021. The largest increase in the nominal facility price was 16.4% between 2017 and 2018 and the largest decrease in the nominal facility price was 17.5% between 2012 and 2013. The largest increase in the adjusted non-facility price was 7.3% between 2013 and 2014. The largest increase in the adjusted facility price was 8.6% between 2012 to 2013. The largest decrease in the adjusted non-facility price was 87.4% between 2022 and 2023 and the largest decrease in the adjusted facility price was 88.4% (Figure 3). The

Nominal Reimbursement versus RVU

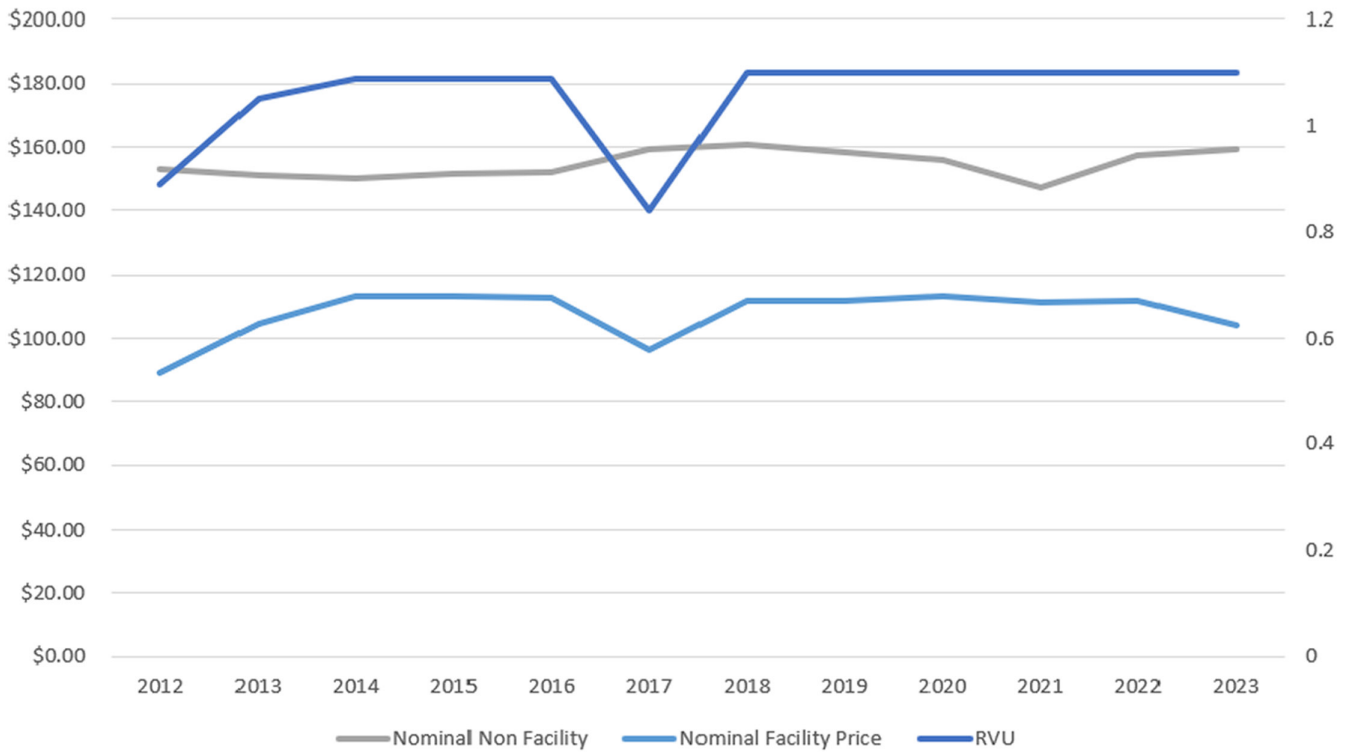


FIGURE 1 Nominal facility (light blue line) and non-facility (gray line) reimbursement over time in dollars. The dark blue line represents the corresponding relative value units (RVUs) over time.

Adjusted Reimbursement versus RVU

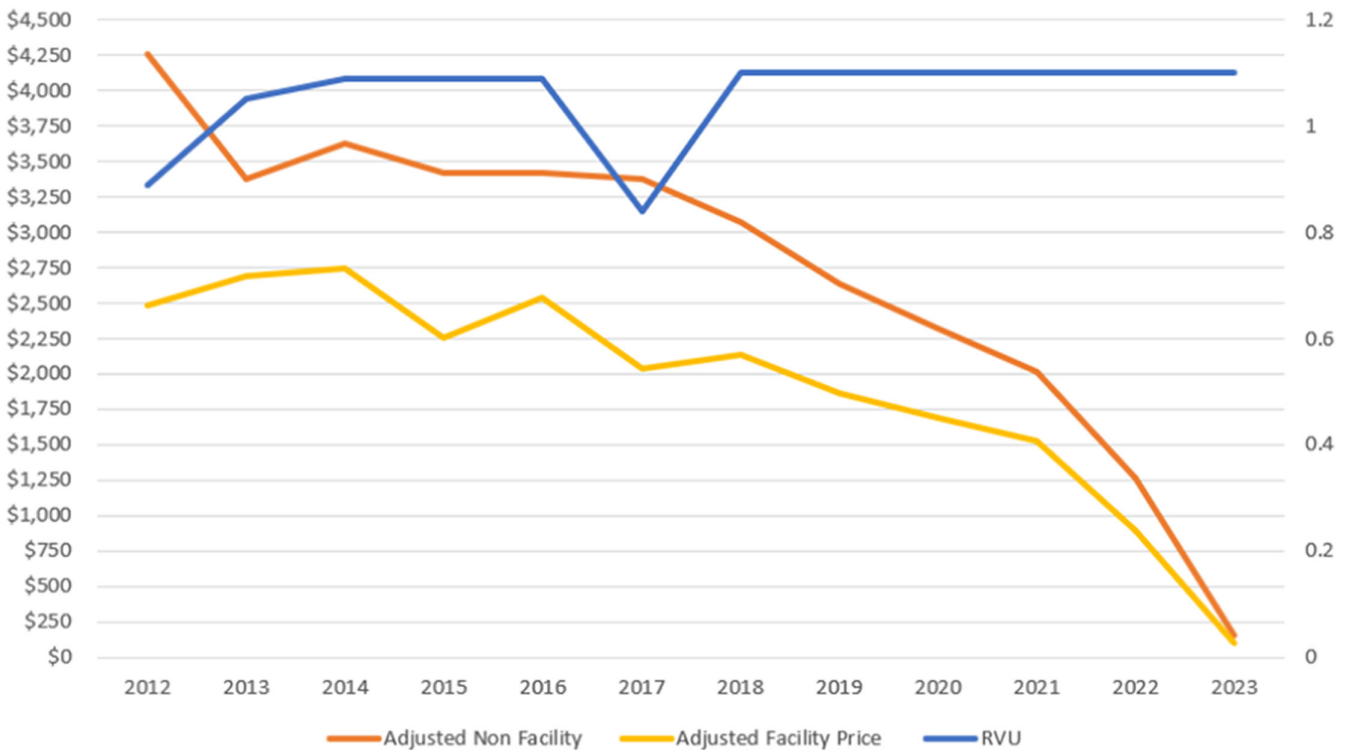


FIGURE 2 Adjusted facility (yellow line) and non-facility (orange line) reimbursement over time in dollars. The dark blue line represents the corresponding relative value units (RVUs) over time.

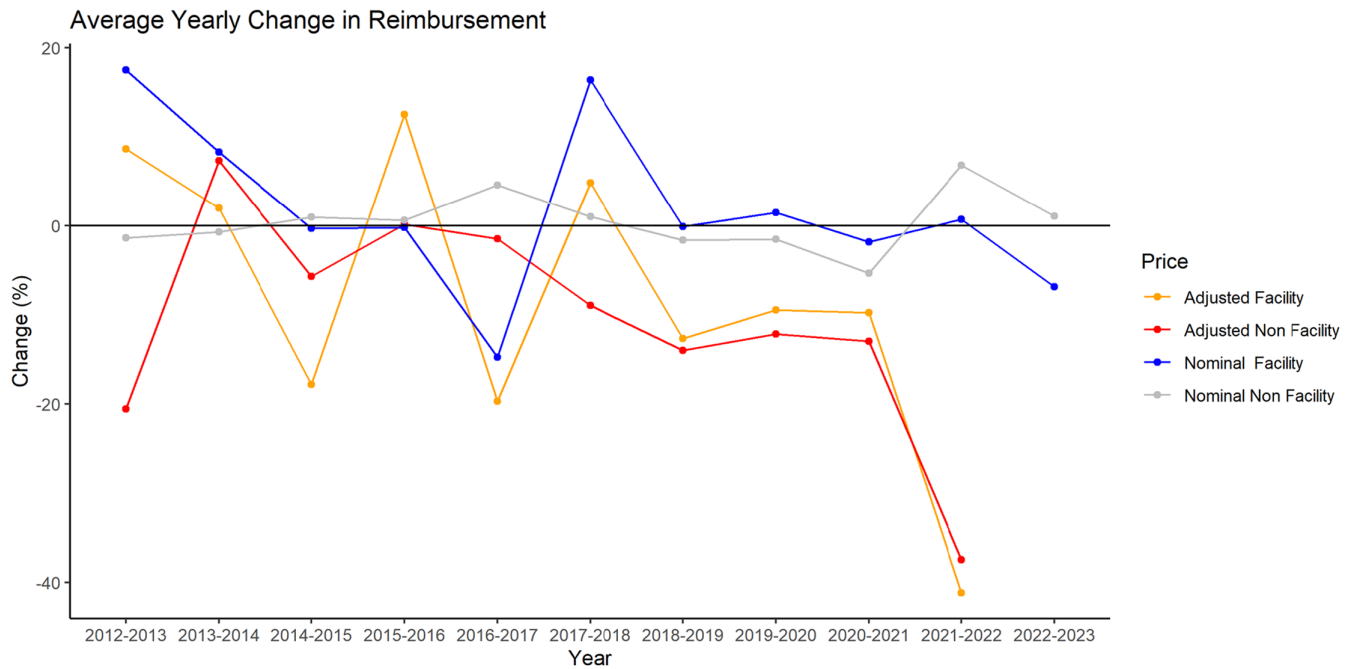


FIGURE 3 Average percent change in adjusted and nominal facility and non-facility reimbursement annually from 2012 to 2023. Adjusted prices for 2022–2023 as they are a large outlier and would not fit onto the graph.

adjusted facility and non-facility price percent change in reimbursement from 2022 and 2023 was not depicted in Figure 2 as it would not reasonably fit onto the graph. We were able to characterize reimbursement changes on a per-procedure basis to determine variability between procedures. These results showed that all procedures experienced a decrease in reimbursement when adjusted for inflation (Figures 4 and 5). The greatest mean decrease was 97.9% in CPT code 96360 (intravenous infusion, hydration; initial, 31 min to 1 h) for the non-facility price and 96.6% for CPT code 96450 (chemotherapy administration, into CNS (e.g., intrathecal), requiring and including spinal puncture) for the facility price. The smallest decrease was 87.9% for CPT code 38220 (diagnostic bone marrow; aspiration/aspirations) for the facility price and 73.7% for CPT code 96440 (chemotherapy administration into pleural cavity, requiring and including thoracentesis) for the non-facility price. For each code, R-squared values were obtained to assess the strength of the correlation between time and changes in reimbursement. The range for this set of R-squared values was 0.590 to 0.910 with a mean of 0.820 indicating a strong correlation between time and a decrease in compensation.

4 | DISCUSSION

This study reveals that average Medicare reimbursement rates for common procedures in the field of hematology/oncology decreased by approximately 96.1% for the facility and 96.6% for the non-facility price, despite an increase in the nominal, or unadjusted, reimbursement of 9.2% for the non-facility price. For the facility price, nominal reimbursement dropped 4.4%. It is important

to note that while there were some notable fluctuations in reimbursement each year, the steepest downtrends in reimbursement occurred within the most recent years of the time frame studied. The steepest decline was in 2017, likely due to policy changes, but this warrants further study. Understanding these reimbursement trends in the context of a changing healthcare market is crucial for institutions to provide appropriate support for hematology/oncology clinicians and their patients. The implications of decreased reimbursement rates over time for common procedures in hematology/oncology are significant as federally funded health insurance programs such as Medicare and Medicaid influence the decisions of private payers.¹³ More importantly, such decreases in reimbursement can alter access to care as demonstrated in a National Bureau of Economic Research report concluding that for every \$10 increase in reimbursement, Medicaid recipients were 1.4% more likely to report a doctor visit.¹⁴ These changes in reimbursement will most acutely impact the vulnerable geriatric population as only 13% of Medicare beneficiaries are under the age of 65 per CMS data for the year 2020.¹⁵ It is projected that the largest increases in incidence cancer rates in the United States will be among those that are ≥75 years old or older,¹⁶ thus this link between reimbursement and physician visits may result in worse outcomes as older adults may forego treatment and follow-up. Moreover, it is estimated that by 2030 an estimated 67 million Americans aged 65 and older will be enrolled in Medicare, an increase of more than 27 million beneficiaries from 2010 with the largest growth occurring among 65- to 74-year-olds with spending projected to double between 2010 and 2030 to about \$1.2 trillion annually in 2030 (in constant 2009 dollars).¹⁷ Existing strategies to improve reimbursement rates such as the Merit-Based

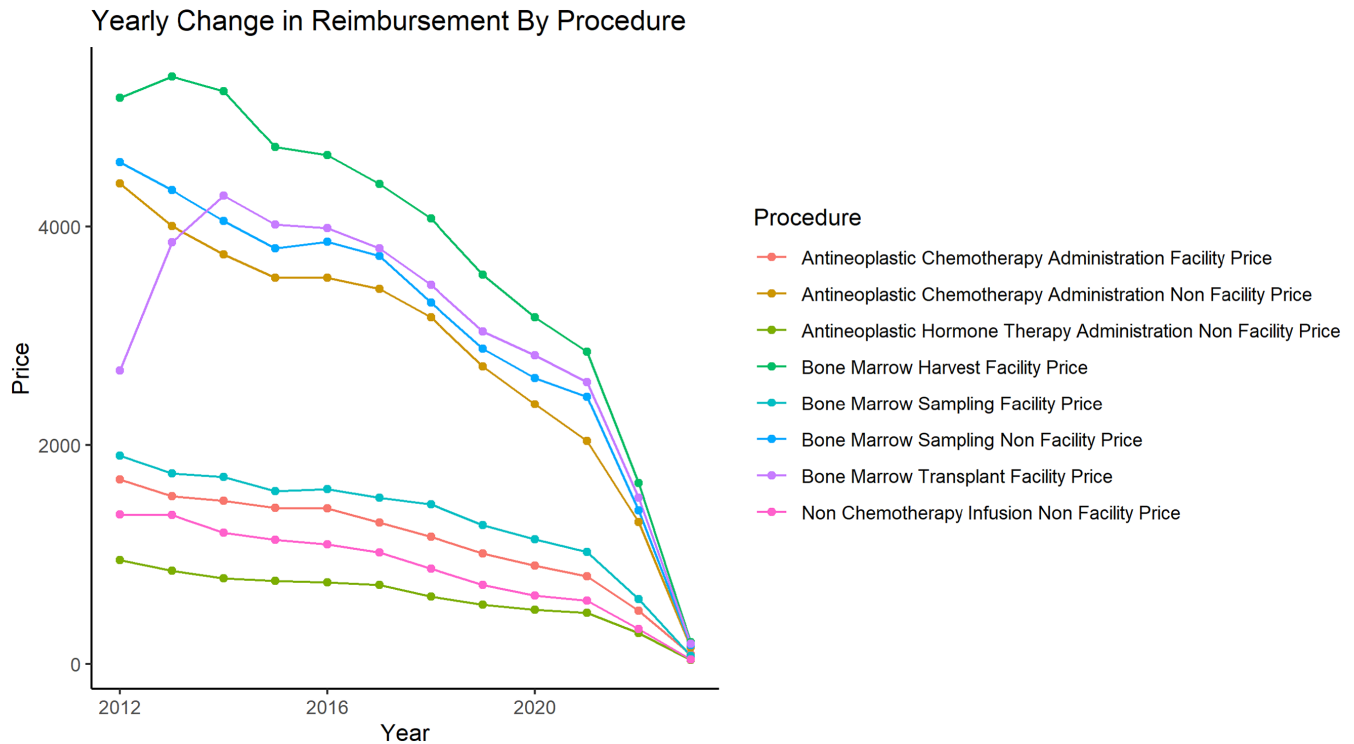


FIGURE 4 Trends in facility and non-facility reimbursement by procedure (antineoplastic chemotherapy, antineoplastic hormone therapy, bone marrow harvest, bone marrow sampling, bone marrow transplant, non-chemotherapy infusion).

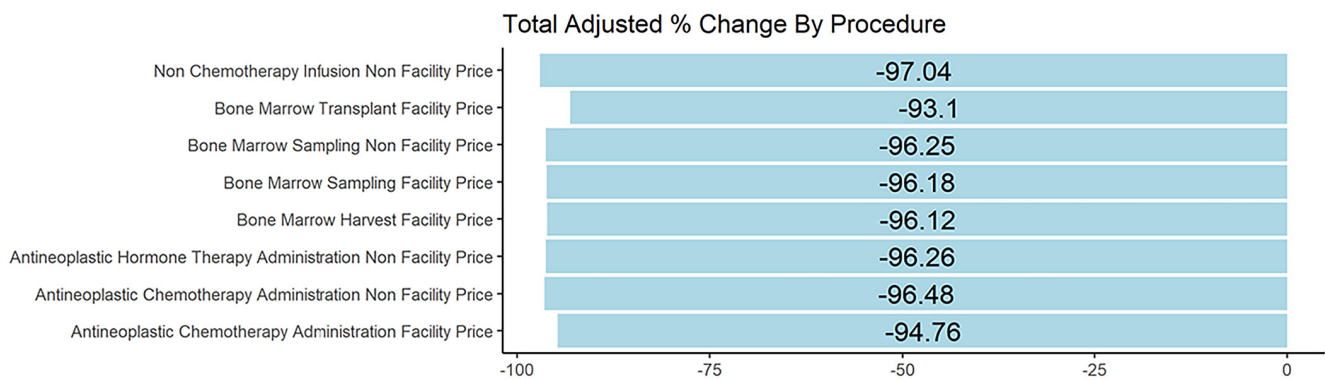


FIGURE 5 Total percent change in facility and non-facility reimbursement by procedure adjusted for inflation of the study period.

Incentive Payment System (MIPS) and accountable care organizations (ACOs) are being evaluated by the Centers for Medicare and Medicaid Innovations Center.¹⁸ More specific to geriatric oncology, CMS' Oncology Care Model, an episode-based alternative payment model designed to incentivize high-value care in contrast to fee for service has been successful in reducing costs across various practices by embracing practice transformation through administrative and clinical changes, enhanced communication, and prioritizing quality improvement.¹⁹ An observational study from the University of Alabama at Birmingham Health System Cancer Community Network focusing on the geriatric oncology population found that the use of a lay person navigator decreased cost and health care utilization²⁰ and another study based on Medicare

administrative claims data found that lay navigation reduced health care utilization in older adults with breast cancer, providing further evidence that the use of navigators can be cost effective.²¹ No matter what strategies are utilized to improve reimbursement rates they would have to keep up with inflation and increases in volume of services rendered.¹⁸

The major strength of our study is the use of numerous CPT codes that are commonly billed for in the field of hematology/oncology which allows for a more detailed analysis of the trends in physician reimbursement in hematology/oncology practices that provide care for Medicare beneficiaries than would be possible if a fewer number of codes were analyzed. Additionally, we grouped the chosen codes into categories and also analyzed the correlation

between time and change in reimbursement for each code resulting in a robust analyses that yielded consistent results.

There are limitations to our study as we utilized Medicare reimbursement data alone which does not capture trends in private health insurance plans. Using facility and non-facility prices in our study allowed some comparison in trends within different settings, but not all codes have both prices listed in the Physician Fee Schedule for the years studied. Further research should focus on the impact of the decrease in reimbursement on patient care.

While our study explores reimbursement trends for hematology/oncology procedures in the United States and thus is only applicable to US practices, identifying risks to the sustainability of practices such as continuously decreasing reimbursement rates is important to build adaptable healthcare systems that serve the needs of the population. Physician leaders should be informed of these trends as their valuable input can inform government policies.

5 | CONCLUSION

From 2012 to 2023, hematology/oncology CPT codes have experienced a decline in inflation-adjusted reimbursement, while RVU valuation of these codes has increased. These trends parallel trends seen in surgical and radiation oncology. Further study is needed to better evaluate the impact of decreased reimbursement on patient care. Novel payment strategies must be implemented to improve physician reimbursement to sustain hematology/oncology practices.

AUTHOR CONTRIBUTIONS

J. Conic was responsible for the study design, statistical analysis, preparation of the manuscript, and manuscript submission. T. Reske was responsible for manuscript preparation.

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CONFLICT OF INTEREST STATEMENT

The authors have no conflict of interest to disclose.

ETHICS STATEMENT

This research is deemed not human subjects research by the IRB at Louisiana State University (#6964). Data is publicly available free of charge at <https://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/PFSlookup>.

ORCID

J. Conic  <https://orcid.org/0000-0002-2267-4087>

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