Neuromusculoskeletal Medicine (OMT) Original Article

Evan G. Starr*, BS, Jacob F. Smith, BS, Romney B. Hanson, BS, Jonathan B. Woolstenhulme, BS, Andrew J. Roush, BS, Nathan B. Sperry, BS, Benjamin Wilde, DO, Amanda E. Brooks, PhD and Isain Zapata, PhD

Utilization and reimbursement trends of osteopathic manipulative treatment for Medicare patients: 2000–2019

https://doi.org/10.1515/jom-2022-0174
Received August 17, 2022; accepted February 7, 2023;
published online March 31, 2023

Abstract

Context: Osteopathic manipulative treatment (OMT) has been established as a beneficial and noninvasive treatment option for multiple conditions. With the total number of osteopathic providers tripling and the subsequent increase in osteopathic physician representation, we would expect the clinical use of OMT to increase accordingly.

Objectives: To that end, we evaluated the utilization and reimbursement of OMT services among Medicare beneficiaries.

Methods: Current procedural terminology (CPT) codes 98925 to 98929 were accessed from the Center for Medicare and Medicaid Services (CMS) from 2000 to 2019. These codes indicate OMT treatment, 98925 (1–2 body regions treated), 98926 (3–4 body regions treated), 98927 (5–6 body regions treated), 98928 (7–8 body regions treated), and 98929 (9–10 body regions treated). Monetary reimbursement from Medicare was adjusted for inflation, and total code volume was scaled to codes per 10,000 beneficiaries to account for the increase in Medicare enrollment.

Results: Overall OMT utilization declined between 2000 and 2019 by 24.5%. A significant downward trend in the utilization of CPT codes for OMT involving fewer body regions (98925–98927) was observed, and was contrasted by a slight upward trend in the use of codes for more body regions (98928, 98929). The adjusted sum reimbursement of all codes decreased by 23.2%. Lower value codes showed a higher rate of decline, whereas higher value codes changed less dramatically.

Conclusions: We conjecture that lower remuneration for OMT has disincentivized physicians financially and may have contributed to the overall decline in OMT utilization among Medicare patients, along with a decreased number of residencies offering specific training in OMT, and increased billing complexity. In considering the upward trend of higher-value code usage, it is possible that some physicians are increasing the comprehensiveness of their physical assessment and associated OMT to reduce the overall financial impact of reimbursement cuts.

Keywords: medicare; osteopathic manipulative treatment; reimbursement.

The application of osteopathic manipulative treatment (OMT) is unique to osteopathic physicians as a noninvasive treatment modality utilized in addition to traditional medical procedures. OMT has shown to be effective in treating a variety of dysfunctions ranging from chronic lower back pain [1] to treatment of migraines [2], and even in managing symptoms of irritable bowel syndrome [3]. OMT is utilized predominantly in primary care settings and is provided by both primary care physicians and specialists including osteopathic neuromusculoskeletal medicine specialists [4].

OMT is utilized in both inpatient and outpatient settings. Treatments are documented and billed for, in addition to and distinctly separate from, the encounter's standard evaluation and management (E&M) code. To support the

***Corresponding author: Evan G. Starr,** BS, Rocky Vista University College of Osteopathic Medicine, 1722 E 70 S, Heber City, UT, 84032-1245, USA, E-mail: evangstarr@gmail.com
Jacob F. Smith, BS, Mayo Clinic Alix School of Medicine, Scottsdale, AZ, USA
Romney B. Hanson, BS, University of Colorado School of Medicine, Aurora, CO, USA
Jonathan B. Woolstenhulme, BS, University of Utah School of Medicine, Salt Lake City, UT, USA
Andrew J. Roush, BS **and Nathan B. Sperry,** BS, Rocky Vista University College of Osteopathic Medicine, Ivins, UT, USA
Benjamin Wilde, DO, Department of Clinical Sciences, Rocky Vista University College of Osteopathic Medicine, Billings, MT, USA
Amanda E. Brooks, PhD, Office of Research and Scholarly Activity, Rocky Vista University College of Osteopathic Medicine, Ivins, UT, USA
Isain Zapata, PhD, Department of Biomedical Sciences, Rocky Vista University College of Osteopathic Medicine, Parker, CO, USA

usage of the OMT treatment, the physician performs a physical examination identifying the presence of somatic dysfunction diagnoses located in 10 body regions: head, cervical, thoracic, lumbar, sacral, pelvic, lower extremity, upper extremity, rib cage, and the abdomen/other regions (diagnosis codes M99.00-09). The physician then utilizes OMT to treat the most clinically significant dysfunctions. Reimbursement is determined by the total number of body regions treated.

The proportion of osteopathic physicians in the total physician community, which includes both allopathic (MD) and osteopathic (DO) physicians, has increased from 6.9% of the total workforce to 9.9% from 2010 to 2020 [5]. The total number of licensed, practicing DO providers increased nearly threefold, from 44,918 in 2000 to 121,006 in 2019 [6]. With increased representation of osteopathic physicians in the physician workforce, we would expect that the number of OMT claims would increase proportionally. Although usage of OMT has been examined with survey data alone, questions regarding objective reimbursement and procedural utilization metrics for OMT remain. This manuscript looks to compare these data among Medicare patients to better understand the patterns of OMT use. This analysis will not only offer insight into how osteopathic physicians treat and bill for OMT services among the Medicare population, but it also has the potential to help the osteopathic medical profession assess one of its defining features. This information can then guide educational efforts in osteopathic colleges of medicine and political lobbying efforts to ensure compensation and the perpetuation of this valuable skill set.

Methods

OMT procedures are billed based on the number of body regions treated, ranging from 0 to 10 regions, with no more than one billed code allowed per day [7]. These codes are 98925 for 1 to 2 body regions, 98926 for 3 to 4 body regions, 98927 for 5 to 6 body regions, 98928 for 7 to 8 body regions, and 98929 for 9 to 10 body regions treated. In this retrospective study, OMT utilization data among Medicare patients from the Part B National Summary Data File on the Centers for Medicare and Medicaid Services (CMS) website for the years 2000 through 2019 was accessed [8]. The Medicare Part B National Summary Data File includes 100% of the services billed to Medicare Part B and reflect true physician reimbursement for the services provided in a given year. The Healthcare Common Procedure Coding System (HCPCS) codes 98925–98929 were utilized to identify the OMT procedures. The data evaluated included "allowed services," or total billing volume in the calendar year, and "allowed charges", which is the payment total disbursed by Medicare in the calendar year.

Average reimbursement per code billed was determined by dividing the allowed charges by the allowed services. The reimbursement data were adjusted for inflation utilizing the Consumer Price Index (CPI) Inflation Calculator utilizing the buying power for December 31 of each respective year relative to January 1, 2022 [9]. Service volume data were adjusted for the total number of Medicare enrollees utilizing data from cms.gov and census.gov [10, 11] to obtain the ratio of OMT codes billed per 10,000 Medicare beneficiaries (Appendix). All data were evaluated descriptively based on their frequencies and proportions.

Results

From 2000 to 2019, the total number of claims billed for OMT procedures (98925–98929) had a negative trend (Figure 1, Table 1). Proportional comparisons of 2000 to 2019 demonstrated a –24.46% change. The only increase in utilization was observed in the 5-year interval from 2000 to 2004 followed by a decrease in utilization in all other intervals.

When comparing each OMT procedure code individually (Figure 2, Table 2), a constant decrease in codes 98925, 98926, and 98927 (fewer number of body regions treated) with an overall decrease in code utilization was observed. These were very large decreases of –63.8%, –43.99%, and –11.82% respectively. On the other hand, an increase in codes 98928 and 98929 (larger number of body regions treated) was observed. These corresponded to a total percent increase of 46.03% and 88.91%, respectively. To further elucidate these observed changes in billing, we investigated the reimbursement trends over the same time periods. Overall, reimbursements per code for all five codes showed a proportional decrease in value through the years. The codes representing more body regions showed a smaller decrease compared to codes representing fewer body systems. Codes 98925, 98926, and 98927 decreased at a rate of –25.6%, –25.3%, and –20.7%, respectively, whereas codes 98928 and 98929 decreased at rates of –17.1% and –12.5%, respectively.

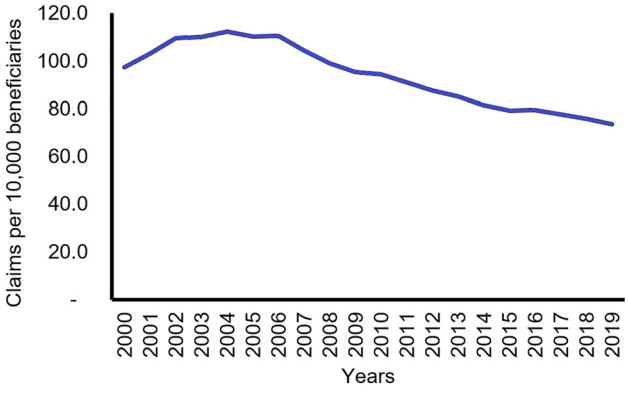

Figure 1: Twenty-year trend of Medicare claims of osteopathic manipulative treatment (OMT) per 10,000 beneficiaries.

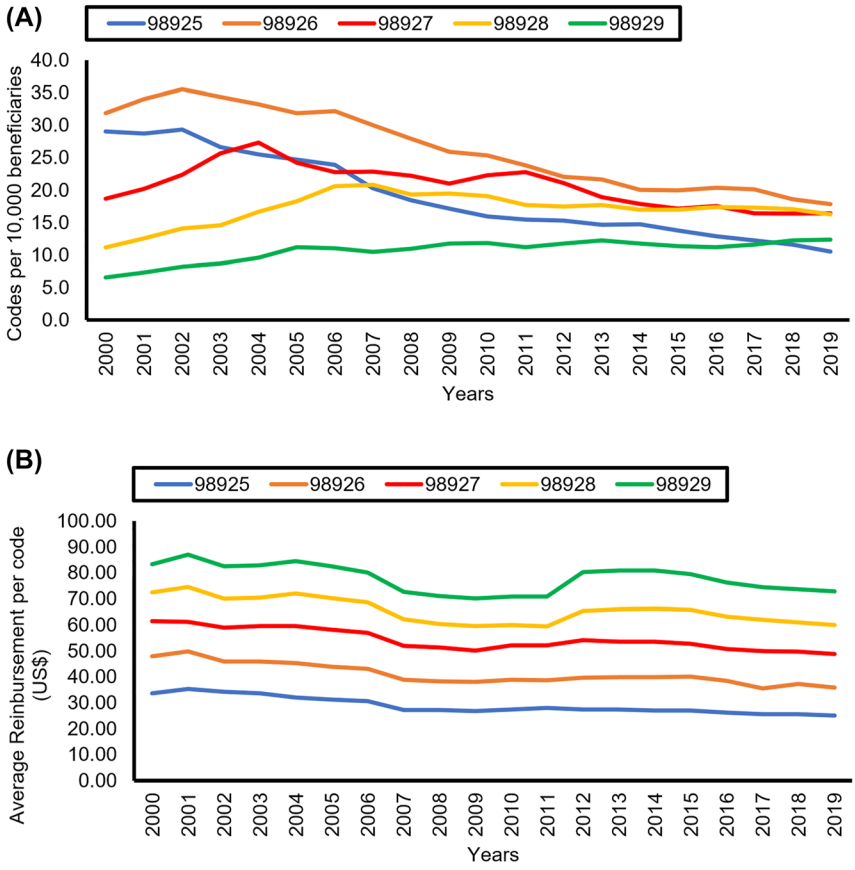

Figure 2: Twenty-year trends of Medicare claims of individual osteopathic manipulative treatment (OMT) codes per 10,000 beneficiaries. (A) Itemized OMT codes per 10,000 beneficiaries. (B) Average reimbursement per individual OMT code.

Total average reimbursement showed similar rates of decline (Figure 3; Table 3). The adjusted sum reimbursement of combined codes 98925–98929 from 2000 to 2019 shows a decrease of –23.2%, which equates to $11.24 on average. The 5-year interval from 2010 to 2014 indicates the only noted increase in reimbursement for OMT services rendered. Years 2000 to 2009 represent the largest decrease in reimbursement per claim as well as percent change.

Table 1: Twenty-year trends of Medicare analyzed by subintervals.

Period	Difference (per 10,000 beneficiaries)	Percent
5-year period intervals		
2000–2004	15.049	15.48%
2005–2009	–14.952	–13.57%
2010–2014	–13.084	–13.86%
2015–2019	–5.823	–7.35%
10-year period intervals		
2000–2009	–1.995	–2.05%
2010–2019	–20.980	–22.22%
20-year period interval		
2000–2019	–23.785	–24.46%

Discussion

With the data retrieved from CMS, we compared OMT utilization and reimbursement information to identify billing trends from the last 20 years of clinical practice. With the increase in osteopathic physician representation in the total physician workforce, it is reasonable to assume that an increase in OMT utilization would be observed, but the inverse was found. Overall OMT utilization decreased. Concurrently, reimbursement from Medicare for OMT procedures decreased.

An understanding of the connection and interdependence between the body's regions and systems guides osteopathic physicians to consider treatment of multiple body regions in response to a seemingly localized presenting complaint. Shifting toward comprehensive treatment (multiple body regions) as a strategy to maximize reimbursement may have an additional positive impact by promoting a more thorough diagnostic approach and addressing body dysfunctions that might have been previously overlooked.

Further assessment of the yearly trends in this study demonstrated a decrease in reimbursement in 2007. Although this could be related to the financial downturn and economic slowing in 2008, there was an overall

Table 2: Twenty-year trends of Medicare claims analyzed by subintervals by individual OMT codes.

Period	1–2 body regions – 98925, %	3–4 body regions – 98926, %	5–6 body regions – 98927, %	7–8 body regions – 98928, %	9–10 body regions – 98929, %
5-year period intervals					
2000–2004	−12.35%	4.38%	46.38%	49.63%	46.69%
2005–2009	−30.56%	−18.65%	−13.23%	6.65%	4.67%
2010–2014	−7.29%	−21.11%	−19.82%	−10.79%	−0.81%
2015–2019	−23.70%	−10.76%	−4.17%	−4.19%	8.98%
10-year period intervals					
2000–2009	−41.02%	−18.49%	12.46%	74.52%	79.00%
2010–2019	−33.83%	−29.67%	−26.31%	−14.56%	4.76%
20-year period interval					
2000–2019	−63.80%	−43.99%	−11.82%	46.03%	88.91%

OMT, osteopathic manipulative treatment.

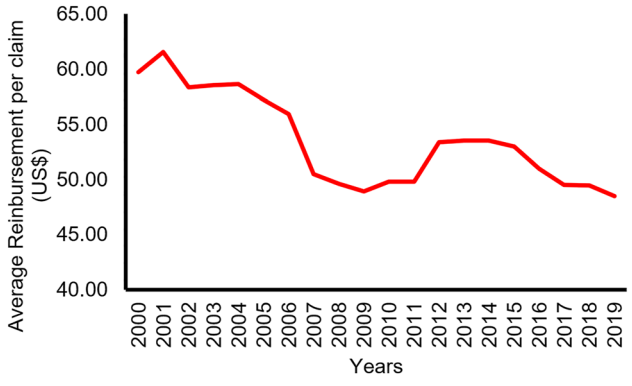

Figure 3: Twenty-year trends of averaged reimbursement for all osteopathic manipulative treatment (OMT) codes.

increase in Medicare spending during the same time period [12–14]. This points to disparate redistribution of Medicare funds away from OMT services.

Due to the majority of OMT use being performed by primary care providers (PCPs), understanding Medicare reimbursement to primary care affords useful insight. Reid et al. [15] found that for narrow definitions of PCPs and primary care services, primary care represented 2.12% of Medicare spending, and for broad definitions represented 4.88% of spending. Given that Medicare spending on primary care services represents such a small percentage of its overall spending, and given that an enhanced focus on primary care is likely to have beneficial effects on the outcomes,

Table 3: Twenty-year trends of average Medicare claims analyzed per claim.

Period	Difference ($ per claim)	Percent
5-year period intervals		
2000–2004	−1.09	−1.83%
2005–2009	−8.30	−14.52%
2010–2014	3.75	7.54%
2015–2019	−4.48	−8.45%
10-year period intervals		
2000–2009	−10.83	−18.13%
2010–2019	−1.29	−2.59%
20-year period interval		
2000–2019	−11.24	−18.82%

quality, and cost of US healthcare [16], it is imperative that any reductions in reimbursement for valuable primary care services, including for OMT, be critically justified.

Despite an increase in reimbursement per CPT code in 2011, there remained a downward trend of reimbursement for codes observed in this study. We suspect that a major contributor to this is legislation enacted by Congress, including but not limited to both the Affordable Care Act (ACA) and Budget Control Act (BCA) of 2011. The ACA, for example, outlined adjustments in price formulas that determine the reimbursement that Medicare gives to healthcare providers. The BCA reduced Medicare fundings for its plans and payments to providers [17].

A comparison of the number of licensed osteopathic physicians to the number of OMT codes billed in that same year reveals that in the year 2000, the ratio of OMT codes billed per osteopathic physician was 8.49. Comparatively, this ratio in 2019 dropped to 2.71. This represents a −68.1% drop in the number of OMT codes billed per osteopathic physician. This could be due to the fact that not all osteopathic physicians utilize OMT in their clinical practices due to preference, lack of continuing education, inadequate facilities, and/or specialty specific limitations. Many osteopathic physicians choose to do their postgraduate education in allopathic residencies, where continued training in OMT is not uniformly available [18]. The American Osteopathic Association (AOA) had 954 eligible programs in 2014–2015. Following the implementation of the single accreditation system, 692 (72.5%) of the eligible programs achieved Accreditation Council for Graduate Medical Education (ACGME) accreditation by 2020 [19]. A decrease in the number of osteopathic programs may also contribute to decreased use and education of OMT, which might have otherwise utilized and promoted OMT more commonly in residency. This correlates with a survey study indicating

that osteopathic physicians report utilizing OMT on 5% or less of their patients, and only 3%–6% of osteopathic physicians utilized it with patients over the last 20 years [20].

Although this might help explain the decrease in utilization, the overall lack of OMT usage is likely due to several factors. The decrease in compensation for OMT over the last 20 years seems to be a limiting factor for some physicians. Along with physician time restraints, these cuts in compensation represent a major barrier limiting the usage of OMT [21]. Additionally, some providers may have opted out of Medicare at the time of our analysis due to regulatory complexity, patient population characteristics, or a variety of other reasons. As of August 2022, 154 osteopathic manipulative medicine providers had opted out of Medicare. Therefore, the analysis does not capture the totality of OMT delivered by providers [22].

It is important to note that the Medicare data evaluated in this study does not provide details regarding the fee-for-service osteopathic manipulative medicine (OMM) practices. With this limitation, we are unable to tie specific billing practices to individual physicians, clinical settings, or geographic regions. It is possible that some clinics completely eliminated their use of OMT, whereas others increased theirs. Some residencies offer a specialized training curriculum of osteopathic neuromuscular medicine (ONMM) that focuses heavily on OMT use for multiple body systems. The increase in higher value codes could be from an increase in board-certified neuromuscular medicine (NMM) physicians and OMT specialists offering these comprehensive services. Further studies should be conducted to elucidate this potential relationship as well as prioritization of time by different specialty types.

We conjecture that lower remuneration for OMT has disincentivized physicians financially and contributed to the overall decline in OMT utilization among Medicare patients. In considering the upward trend of higher value code usage, however, it is possible that some physicians are increasing the comprehensiveness of their physical assessment and associated OMT. Treatment of more body regions would then justify the use of higher-level codes and would, therefore, reduce the overall financial impact of OMT reimbursement cuts for individual physicians and clinics. Further investigation should be conducted to identify if correlation exists between the increased billing codes and their associated diagnostic codes.

This study is not without significant limitations. Medicare was this study's sole source of volume and reimbursement data. Data from providers that have opted out of Medicare and others that deliver care to privately insured patients were not included. Direct reimbursement for services is not measured here. Medicare is the single largest insurance payer in the United States, and it is important to note that its beneficiaries represent an older population whose medical needs may differ significantly from the typical patient receiving OMT. These unique demographics may influence the clinical decision making of a provider that performs OMT for Medicare beneficiaries. With 67% of all Medicare beneficiaries having two or more chronic conditions affecting their health, this population represents an increased challenge to Medicare providers [23]. Due to the complexity of their care, physicians may prioritize other examinations or treatments over OMT. Clinicians may also be limited by financial constraints when accepting or providing care to Medicare beneficiaries, and the sheer complexity of Medicare billing rules and regulations for successful OMT reimbursement may decrease a physician's interest in offering treatment [24, 25]. This study is limited by the factors mentioned previously, and we stress that a decrease in Medicare billing of OMT may not be indicative of a decrease in OMT utilization clinically. While our results may not be wholly generalizable to the greater health system, we posit that Medicare's outsized influence on the private insurance marketplace will influence important trends in the health economics of OMT generally [26]. Additionally, this study analyzes trends in OMT use, utilization, and reimbursement nationwide. Recognizing that substantial geographic variation exists within the nation and in both healthcare spending and use, future research should explore the effect of local factors that might lead to disparate use of and reimbursement for OMT in dissimilar regions of the United States [27].

This study's focus on OMT does not reveal whether similar decreases in compensation from Medicare exist for nonosteopathic treatment modalities in similar primary care settings. Future research should examine these trends and be compared to the steady decline in reimbursement for OMT. The proven efficacy of OMT should prompt advocacy for sustainable and fair reimbursement [1, 28, 29]. Furthermore, it has been shown that OMT can be effective in patients of all ages, including the elderly [30]. Practical application of OMT and its educational curriculum should be evaluated to ensure that this valuable modality can be adequately utilized in practice for patients of all ages.

Conclusions

OMT is an essential tool proven to enhance patient care, and the decline in its utilization is concerning. One factor

contributing to decreased utilization of OMT is the declining reimbursement by Medicare due to multiple legislative and political actions. Physicians are responding to this changing landscape by either decreasing OMT utilization altogether, or by treating more body regions to offset this decrease in reimbursement. This is likely a temporary solution because reimbursement amounts may continue to decrease. Comparisons to office visits without an associated billed procedure with their associated reimbursement trends may be required to determine if the negative trends surrounding OMT utilization and reimbursement are just one part of a much larger issue. Solutions, legislative or otherwise, could then be aptly identified and addressed.

Acknowledgments: Conner Leavitt, BS, was instrumental in the initial understanding of the statistical findings and trend graphs.
Research funding: None reported.
Author contributions: E.G.S., J.F.S., R.B.H., and J.B.W. provided substantial contributions to conception and design, acquisition of data, or analysis and interpretation of data; all authors drafted the article or revised it critically for important intellectual content; all authors gave final approval of the version of the article to be published; and all authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.
Competing interests: None reported.

References

1. Licciardone JC, Brimhall AK, King LN. Osteopathic manipulative treatment for low back pain: a systematic review and meta-analysis of randomized controlled trials. BMC Musculoskelet Disord 2005;6:43.
2. Cerritelli F, Ginevri L, Messi G, Caprari E, Di Vincenzo M, Renzetti C, et al. Clinical effectiveness of osteopathic treatment in chronic migraine: 3-armed randomized controlled trial. Compl Ther Med 2015;23:149–56.
3. Müller A, Franke H, Resch KL, Fryer G. Effectiveness of osteopathic manipulative therapy for managing symptoms of irritable bowel syndrome: systematic review. J Am Osteopath Assoc 2014;114:470–9.
4. Johnson SM, Kurtz ME. Conditions and diagnoses for which osteopathic primary care physicians and specialists use osteopathic manipulative treatment. J Am Osteopath Assoc 2002;102:527–40.
5. Young A, Chaudhry H, Pei X, Arnhart K, Dugan M, Simons K. FSMB census of licensed physicians in the United States, 2020. J Med Regul 2020;107:57–64.
6. American Osteopathic Association. Osteopathic medical profession report; 2013. Available from: https://osteopathic.org/wp-content/uploads/2018/02/2013-OMP-report.pdf.
7. James S, Johannes J, Novak C. Demystifying documentation and billing for osteopathic manipulative treatment. Fam Pract Manag 2021;28:18+.
8. Part B national summary data file (previously known as BESS): CMS.gov; 2021. Available from: https://www.cms.gov/Research-Statistics-Data-and-Systems/Downloadable-Public-Use-Files/Part-B-National-Summary-Data-File/Overview [Accessed 3 Oct 2022].
9. U.S. Bureau of Labor Statistics. CPI inflation calculator. Available from: https://www.bls.gov/data/inflation_calculator.htm.
10. Centers for Medicare and Medicaid Services. CMS Medicare total enrollment 2013–2020. Available from: https://data.cms.gov/summary-statistics-on-beneficiary-enrollment/medicare-and-medicaid-reports/medicare-total-enrollment.
11. U.S. Census Bureau. Census Medicare enrollment 1966–2013. Available from: https://www.census.gov/history/pdf/medicare1966-2013.pdf.
12. AOA. Tenets of osteopathic medicine: American Osteopathic Association; 2019. Available from: https://osteopathic.org/about/leadership/aoa-governance-documents/tenets-of-osteopathic-medicine/ [Accessed May 31 2022].
13. Levine M, Buntin M. Why has growth in spending for fee-for service Medicare slowed?; 2013. Available from: https://www.cbo.gov/sites/default/files/44513_MedicareSpendingGrowth-8-22.pdf [Accessed 25 Apr 2022].
14. Dranove D, Garthwaite C, Ody C. The economic downturn and its lingering effects reduced medicare spending growth by $4 billion in 2009–12. Health Aff 2015;34:1368–75.
15. Reid R, Damberg C, Friedberg MW. Primary care spending in the fee-for-service medicare population. JAMA Intern Med 2019;179:977–80.
16. Friedberg MW, Hussey PS, Schneider EC. Primary care: a critical review of the evidence on quality and costs of health care. Health Aff 2010;29:766–72.
17. White C. How much of the Medicare spending slowdown can be explained? Insights and analysis from 2014 – issue brief: KFF; 2014. Available from: https://www.kff.org/report-section/how-much-of-the-medicare-spending-slowdown-can-be-explained-issue-brief/ [Accessed 25 Apr 2022].
18. Healy CJ, Brockway MD, Wilde BB. Osteopathic manipulative treatment (OMT) use among osteopathic physicians in the United States. J Osteopath Med 2021;121:57–61.
19. Cummings M. The single accreditation system: risks to the osteopathic profession. Acad Med 2021;96:1108–14.
20. Johnson SM, Kurtz ME. Diminished use of osteopathic manipulative treatment and its impact on the uniqueness of the osteopathic profession. Acad Med 2001;76:821–8.
21. Shannon SC, Teitelbaum HS. The status and future of osteopathic medical education in the United States. Acad Med 2009;84:707–11.
22. Centers for medicare & medicaid services data; 2022. Available from: https://data.cms.gov/provider-characteristics/medicare-provider-supplier-enrollment/opt-out-affidavits/data [Accessed 3 Oct 2022].
23. Salive ME. Multimorbidity in older adults. Epidemiol Rev 2013;35:75–83.
24. Snider KT, Jorgensen DJ. Billing and coding for osteopathic manipulative treatment: De Gruyter; 2009. Available from: https://www.degruyter.com/document/doi/10.7556/jaoa.2009.109.8.409/html [Accessed 3 Oct 2022].
25. Billing and coding: osteopathic manipulative treatment: CMS.gov; 2019. Available from: https://www.cms.gov/medicare-coverage-database/view/article.aspx?articleId=57786&ver=3 [Accessed 3 Oct 2022].
26. Clemens J, Gottlieb JD. In the shadow of a giant: Medicare's influence on private physician payments. J Polit Econ 2017;125:1–39.
27. Newhouse JP, Garber AM. Geographic variation in medicare services. N Engl J Med 2013;368:1465–8.

28. Bagagiolo D, Rosa D, Borrelli F. Efficacy and safety of osteopathic manipulative treatment: an overview of systematic reviews. BMJ Open 2022;12:e053468.
29. Noll DR, Degenhardt BF, Morley TF, Blais FX, Hortos KA, Hensel K, et al. Efficacy of osteopathic manipulation as an adjunctive treatment for hospitalized patients with pneumonia: a randomized controlled trial. Osteopath Med Prim Care 2010;4:2.
30. Channell MK, Wang Y, McLaughlin MH, Ciesielski J, Pomerantz SC. Osteopathic manipulative treatment for older patients: a national survey of osteopathic physicians. J Osteopath Med 2016;116:136–43.

Supplementary Material: This article contains supplementary material (https://doi.org/10.1515/jom-2022-0174).