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Changes in Health Care Costs and Mortality Associated With Transitional Care Management Services After a Discharge Among Medicare Beneficiaries

Andrew B. Bindman, MD; Donald F. Cox, PhD

IMPORTANCE Medicare adopted transitional care management (TCM) payment codes in 2013 to encourage clinicians to furnish TCM services after beneficiaries were discharged to the community from medical facilities. To bill for the 30-day service, a care team member must communicate with the beneficiary or the caregiver within 2 business days after the discharge and the clinician must provide an office visit within 14 days.

OBJECTIVE To investigate whether the receipt of TCM services was associated with the subsequent health care costs and mortality of the beneficiaries in the month after the service was provided.

DESIGN, SETTING, AND PARTICIPANTS Retrospective cohort analysis of all Medicare fee-for-service claims for the period of January 1, 2013, through December 31, 2015, for 18 756 707 Medicare fee-for-service beneficiaries with discharges eligible for subsequent TCM services. Discharges from a hospital, an inpatient psychiatric facility, a long-term care hospital, a skilled nursing facility, an inpatient rehabilitation facility, or an outpatient facility for an observational stay were included. Data analysis was performed from July 2016 to March 2018.

EXPOSURE Furnishing of TCM services for the 30 days following an eligible discharge for Medicare beneficiaries as reflected in Medicare fee-for-service claims.

MAIN OUTCOMES AND MEASURES Total Medicare (Parts A, B, and D) health care costs and mortality in the 31 to 60 days after discharge, which is 30 days beyond the potential period for which the beneficiary could receive TCM services. Health care costs and mortality were adjusted for beneficiary age, sex, risk score, dual eligibility for Medicare and Medicaid, type of eligible discharge, year of discharge, and whether the eligible discharge to the community included home health care.

RESULTS Of 18 756 707 eligible Medicare beneficiaries during the study period, 43.9% were male and had a mean (SD) age of 72.5 (13.8) years. Transitional care management services were billed following eligible discharges in 3.1% of cases in 2013, 5.5% in 2014, and 7.0% in 2015. The adjusted total Medicare costs ($3358; 95% CI, $3324-$3392 vs $3033; 95% CI, $3001-$3065; $P < .001$) and mortality (1.6%; 95% CI, 1.6%-1.6% vs 1.0%; 95% CI, 1.0%-1.1%; $P < .001$) were higher among those beneficiaries who did not receive TCM services compared with those who did receive TCM services in the 31 to 60 days following an eligible discharge.

CONCLUSIONS AND RELEVANCE Despite the apparent benefits of TCM services for Medicare beneficiaries, the use of this service remains low. An assessment should be made of interventions that can increase the appropriate use of this service.

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Invited Commentary
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Author Affiliations: Agency for Healthcare Research and Quality, US Department of Health and Human Services, Washington, DC (Bindman); Now with Philip R. Lee Institute for Health Policy Studies, University of California San Francisco, San Francisco (Bindman); Retired from Office of the Assistant Secretary for Planning and Evaluation, US Department of Health and Human Services, Washington, DC (Cox).

Corresponding Author: Andrew B. Bindman, MD, Philip R. Lee Institute for Health Policy Studies, University of California San Francisco, 3333 California St, Ste 265, San Francisco, CA 94118 (andrew.bindman@ucsf.edu).

The transition of care for patients back to the community after discharge from hospitals and nursing facilities often results in a change of clinicians responsible for managing the care of a patient. This transition of caregivers introduces a vulnerable situation, which may lead to lapses in quality and safety.[1] There is a high rate of complications associated with these transitions of care, particularly for elderly people with chronic health conditions,[2] which can result in adverse events[3] and high health care costs.[4]

Discharge planning from the medical facility is often insufficient to address any medication errors and other complications after discharge, including infections and delirium, which are common among elderly patients with chronic conditions.[5] Investigators have focused on the potential value of outreach to patients soon after discharge[6,7] as well as timely follow-up visits with primary care clinicians[8] as interventions that could reduce the risk of adverse outcomes. Primary care clinicians and other health care practitioners who assume responsibility for the continuing care of a patient are well positioned to furnish transitional care management services, but they may not do so because, until recently, the non-face-to-face activity of contacting a patient soon after discharge was not reimbursed by Medicare.

In 2013, Medicare adopted transitional care management (TCM) payment codes to improve patient outcomes after discharge.[9] Clinicians who provide TCM services receive an enhanced reimbursement rate for an office visit following an eligible discharge. The payment for transitional care varies with the complexity of the patient needs: specified non-face-to-face care coordination services in addition to an office visit following discharge from a hospital, a skilled nursing facility, a rehabilitative facility, or an outpatient facility for an observational stay. For patients with highly complex conditions, the office visit must be within 7 days of an eligible discharge; for patients with moderately complex conditions, the office visit must be within 14 days. In each case, a care team member must also communicate with the beneficiary or caregiver within 2 business days after the eligible discharge. The TCM payment is intended to cover the non-face-to-face services for the 30 days following an eligible discharge, and the service cannot be billed until after that period has transpired. Medicare only allows payment to the first clinician who submits a claim for the service following an eligible discharge.

We conducted a study among all Medicare fee-for-service beneficiaries to determine the frequency of billing for TCM services over time, the characteristics of the eligible patient population, the distribution and specialty characteristics of clinicians using the TCM code for billing purposes, and whether billing for this service is associated with subsequent health care costs and mortality.

Key Points

Question Is there an association between the implementation of transitional care management payment codes and changes in cost and health outcomes for Medicare beneficiaries discharged to the community from medical facilities?

Findings In this cohort study of all 18 756 707 eligible Medicare discharges from various medical facilities during the first 3 years in which transitional care management services were covered, the percentage of billed services ranged from 3.1% in 2013 to 5.5% in 2014 and to 7.0% in 2015. Transitional care management services were significantly associated with reduced costs and mortality in the month after the service was provided.

Meaning Transitional care management services were associated with a reduction in mortality and total Medicare costs in the month after they were furnished.

Methods

We analyzed adjudicated claims on all Medicare beneficiaries from January 1, 2013, through December 31, 2015. Based on the Medicare payment criteria, we considered patients living at the time of discharge to the community from a hospital, an inpatient psychiatric facility, a long-term care hospital, a skilled nursing facility, an inpatient rehabilitation facility, or an outpatient facility for an observational stay to be potentially eligible for TCM services. Data analysis was performed from July 2016 to March 2018. The research study was exempt from the requirements of informed consent under 45CFR46.101 (b) (5) for public benefit or service programs.[10] Data for this study were available to the Agency for Healthcare Research and Quality under the Program Support Center Agency for Healthcare Research and Quality Data Use Agreement No. 20642.

We limited our analysis to beneficiaries who were enrolled in Medicare Parts A and B during the time of discharge and subsequent month when TCM services could have been provided. Consistent with Medicare's billing rules, we excluded those patients receiving case management services as a part of other Medicare services. To eliminate the possibility of misclassifying the transfer of patients to other facilities as discharges, we excluded cases in which the beneficiary was admitted to another medical facility the same day or the following day after a potentially eligible discharge. Since TCM covers the 30 days following an eligible discharge, clinicians cannot bill for this service if the patient dies within the 30 days. This introduces a potential bias because all deaths that occur in the first 30 days after discharge are defaulted to the group that received no TCM even though some patients may have received TCM services prior to their death. Since mortality is one of our main outcomes, we compared the TCM and no TCM groups prospectively beginning 30 days after discharge, when there was no ambiguity on how to sort beneficiaries into treatment groups. We excluded individuals who received hospice care services within 14 days of discharge. We also applied the same logic to the assessment of health care costs beginning 30 days after discharge.

We characterized each eligible discharge according to whether the patient received TCM services if we could link the discharge to TCM billing in Medicare Part B claims within the subsequent 32 days. We also determined whether the beneficiary received home health services during this time. For eligible discharges without subsequent billing for TCM services, we assessed whether clinicians could have provided

these services by determining if an office visit (using evaluation and management billing) was completed without the billing for TCM services within 14 days of the eligible discharge.

We examined the rate at which TCM services were billed among eligible discharges by year. We used the unique National Provider Indicator (NPI) available in TCM claims to examine whether billing was concentrated among a few clinicians. We also used this identifier to link to information available in the Medicare Data on Provider Practice and Specialty[11] and the Medicare Shared Savings Program[12] files to determine whether the clinician was a physician, the specialty of the physician, and whether the clinician participated in a Medicare Shared Savings Program Accountable Care Organization (ACO). Medicare Data on Provider Practice and Specialty characterizes physicians as primary care physicians if they specialize in pediatrics, geriatrics, preventive medicine, family medicine, or internal medicine.

We compared differences in total Medicare (Parts A, B, and D) health care costs and mortality in the 30 days beyond the potential period (31-60 days after discharge) in which the beneficiary could receive TCM services based on whether the beneficiary received TCM services, had an office visit but no TCM services within 14 days of discharge, or had neither TCM nor an office visit within 14 days of discharge.

We assumed a potential dose-response relationship in the exposure to TCM with eligible discharged patients with no TCM and no office visit within 14 days having the lowest exposure, those with no TCM and an office visit within 14 days having moderate exposure, and TCM (which includes an office visit within 14 days) having the highest exposure. We adjusted results based on patient characteristics at the time of an eligible discharge (age, sex, Hierarchical Condition Category risk score, and whether the patient was dually eligible for Medicare and Medicaid); the type of eligible discharge (hospital, inpatient psychiatric facility, long-term care hospital, skilled nursing facility, inpatient rehabilitation facility, or an outpatient facility for an observational stay); year of the discharge; and whether the eligible discharge included home health care. We used linear regression to analyze cost outcomes and tested differences in spending between groups by using least squares means. We used logistic regression to analyze the mortality outcome and compared groups using the delta method. We adjusted SEs used to derive 95% CIs to account for clustering at the hospital service area based on home zip code of the beneficiary.[13] All reported *P* values are 2-sided, and $P < .05$ is considered statistically significant.

We conducted additional analyses to examine whether results were sensitive to the primary diagnosis of the eligible discharge categorized by the Clinical Classifications Software,[14] the study year, and whether the physician providing the TCM service was a primary care physician or part of a Medicare Shared Savings Program ACO.[12] We also examined whether the pattern of results was similar for discharges only from acute care hospitals and whether there were differences in the adjusted hospital readmission rates based on receipt of TCM services during the observation period.

Finally, we reanalyzed the results after introducing a propensity score used to predict receipt of TCM services based on the covariates in our regression models. Introduction of a propensity score had no appreciable influence on the results, and, to simplify the presentation, these results are not reported in this paper. Data were analyzed by personnel at Acumen Limited Liability Corporation.

Results

There were 18 756 707 eligible discharges during the study period, which included 13 497 066 eligible discharges from hospitals, 764 062 from inpatient rehabilitation facilities, 89 900 from long-term care hospitals, 3 671 914 from skilled nursing facilities, 657 138 from inpatient rehabilitation facilities, and 76 627 from an outpatient facility for observational stays. Among eligible discharges, 8 237 280 (43.9%) were males and the mean (SD) age was 72.5 (13.8) years.

We linked billing for TCM services to 975 169 (5.2%) of these eligible discharges. Information on the hospital diagnoses associated with the most frequent subsequent use of TCM services is provided (eTable in the Supplement). The billing rate for TCM services increased over time. Transitional care management was billed 198 541 (3.1%) times following 6 377 968 eligible discharges in 2013, 342 571 (5.5%) following 6 197 205 eligible discharges in 2014, and 434 057 (7.0%) following 6 181 534 eligible discharges in 2015.

The percentage of Medicare beneficiaries with eligible discharges who received TCM services or an office visit without TCM services varied by the type of discharge, by beneficiary characteristics, and by whether the beneficiary was also discharged with home health care (**Table 1**). Compared with Medicare beneficiaries who did not receive TCM services following an eligible discharge, those who received TCM were older (mean [SD] age, 76.3 [11.1] vs 72.3 [13.9] years; $P < .001$) but had slightly lower health risk scores (mean [SD] score, 2.06 [1.57] vs 2.07 [1.71]; $P < .001$) and were less likely to be dually eligible for Medicare and Medicaid (143 246 of 975 169 beneficiaries [14.7%] vs 4 417 881 of 17 781 538 [24.8%]; $P < .001$).

Among the 17 781 538 eligible discharges in which a clinician did not bill for TCM services, at least 1 clinician billed for an office visit 9 279 899 times (52.2%) within 14 days of the eligible discharge. Many measured characteristics of those who did not receive TCM services were similar to those who did or did not receive an office visit within 14 days of a TCM-eligible event. However, those who received an office visit were more likely to have had a hospital discharge as their eligible event (7 087 378 of 9 279 899 beneficiaries [76.4%] vs 5 591 354 of 8 501 639 [65.8%]; $P < .001$). They also had higher health risk scores (mean [SD] scores, 2.11 [1.68] vs 2.02 [1.76]; $P < .001$) and were less likely to be dually eligible for Medicare and Medicaid (1 950 209 of 9 279 899 [21.0%] vs 2 467 672 of 8 501 639 [29.0%]; $P < .001$).

Among the more than 1 million clinicians eligible to bill Medicare for TCM services during the study period, we identified paid TCM claims from 61 887 different clinicians (**Table 2**). Clinicians participating in a Medicare Shared Savings Program ACO[12] were disproportionately more likely to bill for TCM services. The majority of clinicians who billed for TCM services were physicians. While only 186 127 of 626 934 (29.7%)

Table 1. Medicare Beneficiaries With Discharges Eligible for TCM Services, 2013-2015

Characteristic	TCM (n = 975 169)[a]	No TCM		
		Total (n = 17 781 538)	E/M Office Visit (n = 9 279 899)[b]	No E/M Office Visit (n = 8 501 639)
Age, mean (SD), y	76.3 (11.1)	72.3 (13.9)	72.7 (13.2)	72.0 (14.6)
Male, No. (%)	411 328 (42.2)	7 825 952 (44.0)	4 159 441 (44.8)	3 666 511 (43.1)
Discharge site, No. (%)[c]				
Inpatient hospital	818 334 (83.9)	12 678 732 (71.3)	7 087 378 (76.4)	5 591 354 (65.8)
Inpatient psychiatric facility	8132 (0.8)	755 930 (4.2)	297 937 (3.2)	457 993 (5.4)
Long-term care hospital	2834 (0.3)	87 066 (0.5)	42 393 (0.4)	44 673 (0.5)
Skilled nursing facility	109 499 (11.2)	3 562 415 (20.0)	1 461 130 (15.7)	2 101 285 (24.7)
Inpatient rehabilitation facility	36 290 (3.7)	620 848 (3.5)	355 009 (3.8)	265 839 (3.1)
Observational stay	80 (0)	76 547 (0.4)	36 052 (0.4)	40 495 (0.5)
Hierarchical Condition Category risk score, mean (SD)[d]	2.06 (1.57)	2.07 (1.71)	2.11 (1.68)	2.02 (1.76)
Medicare/Medicaid, No. (%)	143 246 (14.7)	4 417 881 (24.8)	1 950 209 (21.0)	2 467 672 (29.0)
Home health care, No. (%)	318 335 (32.6)	4 905 385 (27.6)	2 653 913 (28.6)	2 251 472 (26.5)

Abbreviations: E/M, evaluation and management; TCM, transitional care management.

[a] Results for TCM vs no TCM, TCM vs no TCM and E/M office visit, and TCM vs no TCM and no E/M office visit are all significant at $P < .001$.

[b] Results for no TCM and E/M office visit vs no TCM and no E/M office visit are all significant at $P < .001$.

[c] Percentages may not sum to 100 because of rounding.

[d] Higher Hierarchical Condition Category scores reflect greater morbidity.

of all Medicare physicians are in primary care specialties, they constitute 44 817 of 50 898 (88.0%) of physicians who billed for TCM services.

Billing for TCM services was highly concentrated among a few clinicians and even fewer medical practices. Among all clinicians furnishing TCM services, approximately 10% accounted for 50.3% of the TCM billing (**Figure**). When aggregated at the medical practice level using all NPIs associated with the medical practice tax identification number from claims data, 10% of medical practices accounted for 68.3% of the billed TCM services.

The mean paid reimbursement for TCM services was $145 compared with $105 for an office visit within 14 days of an eligible discharge for a Medicare beneficiary who did not receive TCM services.

Beneficiaries who received TCM services had mean unadjusted total costs to Medicare of $3022 (95% CI, $2980-$3063) in the month (days 31-60 after eligible discharge) after receiving these services. Beneficiaries who did not receive TCM services had costs that were $336 (11.1%) higher (mean unadjusted total costs, $3358; 95% CI, $3311-$3406; $P < .001$) (**Table 3**). After adjusting for beneficiary characteristics as well as whether the beneficiary received home health care, the year of discharge, and the type of discharge, the Medicare costs for those who did not receive TCM after an eligible discharge remained significantly higher than those who did (mean adjusted total costs, $3358; 95% CI, $3324-$3392 vs $3033; 95% CI, $3001-$3065; $P < .001$). Among those who did not receive TCM services, unadjusted and adjusted Medicare costs were substantially higher for those who had an office visit within 14 days of an eligible discharge than for those who did not.

Unadjusted mortality during this same period was 1.1% (95% CI, 1.1%-1.1%) among those who received TCM services and 1.6% (95% CI, 1.6%-1.6%) ($P < .001$) among those who did not (**Table 4**). After adjusting for baseline differences, the absolute mortality was 0.6% higher among those who did not receive TCM services than those who did (1.6%; 95% CI, 1.6%-1.6% vs 1.0%; 95% CI, 1.0%-1.1%; $P < .001$). Among those who did not receive TCM services, beneficiaries who had an office visit within 14 days of an eligible discharge had an adjusted mortality that was significantly lower than those who did not (1.5%; 95% CI, 1.4%-1.5% vs 1.7%; 95% CI, 1.7%-1.7%; $P < .001$), but this rate was still significantly higher than those who received TCM.

Repeating the analysis in subgroups of Medicare beneficiaries based on the Clinical Classifications Software[14] categorization of their primary diagnosis or year for the eligible discharge did not reveal substantial differences in what was observed in the overall results. The adjusted mean total cost of care was significantly lower when TCM services were delivered by a primary care physician ($3005; 95% CI, $2974-$3035) than by a nonprimary care physician ($3126; 95% CI, $3094-$3159; $P = .002$), but there was no significant difference in mortality from 31 to 60 days after discharge by type of clinician (1.1%; 95% CI, 1.1%-1.1% in both groups; $P = .94$). There was no significant difference in the mean total cost of care ($3017; 95% CI, $2987-$3048 vs $3023; 95% CI, $2992-$3054; $P = .83$) or mortality (1.1%; 95% CI, 1.1%-1.1% in both groups; $P = .93$) by whether the clinician providing TCM services was a part of an ACO.[12]

Limiting the analysis to beneficiaries who were eligible for TCM services because of a hospital discharge revealed results similar to those found among beneficiaries who were eligible because of a broader range of discharges. The adjusted mean total costs during the 31 to 60 days after hospital discharge were significantly lower among those who received TCM services ($2975; 95% CI, $2942-$3008) than those who did not ($3357; 95% CI, $3301-$3374; $P < .001$), and mortality was lower in the TCM group as well (1.0%; 95% CI, 1.0%-1.0% vs 1.5%; 95% CI, 1.5%-1.5%; $P < .001$). Consistent with the financial results, the adjusted hospital readmissions during the 31 to 60 days after discharge were significantly lower in the TCM group than the non-TCM group (9.4%; 95% CI, 9.4%-9.5% vs 9.6%; 95% CI, 9.6%-9.6%; $P < .001$).

Discussion

Medicare beneficiaries who receive TCM services have lower total Medicare costs and mortality in the subsequent month compared with beneficiaries who do not receive these services. These effects persisted after adjusting for the demographic and health status of the beneficiaries as well as the type of discharge and whether it included home health care.

We observed a stepwise benefit in mortality with the provision of an office visit within 14 days of an eligible discharge, which was enhanced when an office visit also included TCM services. This observation suggests that clinician contact with a patient within 2 business days after an eligible discharge offers a health benefit beyond what is achieved with the office visit within 14 days.

Despite the apparent benefits of TCM services, the use of this service remains very low and it is growing slowly. The barrier does not appear to be primarily related to the ability to provide an office visit within 14 days after an eligible discharge, as this occurs more than half of the time among all discharges eligible for TCM services, even among those visits for which TCM is not billed.

Clinicians may not have systems to perform some time-sensitive steps. To bill for TCM services requires that (1) the clinician knows that an eligible discharge is occurring; (2) the clinician has the capacity to contact the patient within 2 business days after the discharge; and (3) the clinician has a capacity to bill for the service 30 days after eligible discharge, when, more than likely, they are not providing a face-to-face service.

A small number of clinicians are clustered into an even smaller number of medical practices who have billed for most of the services. Clinician reimbursement for providing TCM services is approximately $40 more than what can be billed for an office visit. This reimbursement amount may not be adequate to encourage a larger number of clinicians to make investments in personnel or workflow necessary to routinely deliver the service. The lack of medical record sharing between institutions responsible for patient discharge and primary care clinicians may also undermine the ability for community-based clinicians to be aware of an eligible discharge and to contact the patient within 2 business days.[15]

While there is no restriction regarding what type of clinician furnishes TCM services, most care is being delivered by primary care physicians. The mean adjusted total cost of care

Table 2. Medicare Clinicians Who Bill TCM Services: 2013-2015

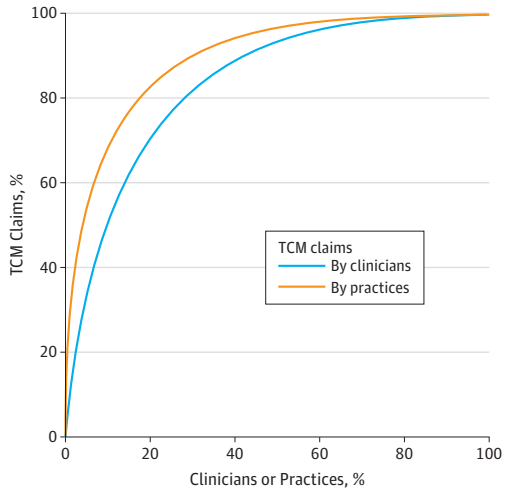
Type of Clinician	No. (%)	
	All Medicare Clinicians in MD-PPAS (n = 1 006 354)[a]	Medicare Clinicians Who Bill TCM Services (n = 61 887)[b]
Participates in Medicare Accountable Care Organization	121 354 (12.0)	14 787 (23.9)
Nonphysician	379 041 (37.7)	8945 (14.4)
Physician	626 934 (62.3)	50 898 (82.2)
Primary care	186 127 (29.7)	44 817 (88.0)
Nonprimary care	440 807 (70.3)	6081 (11.9)

Abbreviations: MD-PPAS, Medicare Data on Provider Practice and Specialty; TCM, transitional care management.

[a] As of December 31, 2014.

[b] $P < .001$ for Medicare clinicians overall vs Medicare clinicians who bill TCM services.

Figure. Cumulative Distributions of Transitional Care Management (TCM) Billing by Clinicians and by Medical Practices, 2013-2015



Clinicians were identified by their National Provider Identifier. Medical practices were identified by the taxpayer identification number used for billing purposes.

Table 3. Medicare Costs 31 to 60 Days After TCM-Eligible Discharge[a]

Type of Visit	Mean Total Cost (95% CI), $		
	Unadjusted	TCM vs No TCM, Adjusted[b]	TCM vs No TCM With or Without E/M Office Visit, Adjusted[b]
TCM	3022 (2980-3063)	3033 (3001-3065)	3052 (3021-3084)
No TCM	3358 (3311-3406)[c]	3358 (3324-3392)[c]	NA
E/M office visit	3702 (3659-3746)[c]	NA	3673 (3640-3707)[c]
No E/M office visit	2983 (2927-3039)	NA	3011 (2973-3049)[d]

Abbreviations: E/M, evaluation and management; NA, not applicable; TCM, transitional care management.

[a] Medicare costs for Parts A, B, and D.

[b] Adjusted for age, sex, risk score, Medicare/Medicaid dual status, home health care, type of discharge, and year of discharge. The 95% CIs are derived from SEs adjusted to account for clustering at the hospital service area based on the home zip code of the beneficiary.

[c] Statistically significant compared with TCM ($P < .001$).

[d] Statistically significant compared with TCM ($P = .002$).

Table 4. Mortality 31 to 60 Days After TCM-Eligible Discharge

Type of Visit	Mortality (95% CI), %		
	Unadjusted	TCM vs No TCM, Adjusted[a]	TCM vs No TCM With or Without E/M Office Visit, Adjusted[a]
TCM	1.1 (1.1-1.1)	1.0 (1.0-1.1)	1.0 (1.0-1.0)
No TCM	1.6 (1.6-1.6)[b]	1.6 (1.6-1.6)[b]	NA
E/M office visit	1.4 (1.4-1.5)[b]	NA	1.5 (1.4-1.5)[b]
No E/M office visit	1.7 (1.7-1.7)[b]	NA	1.7 (1.7-1.7)[b]

Abbreviations: E/M, evaluation and management; NA, not applicable; TCM, transitional care management.

[a] Adjusted for age, sex, risk score, Medicare/Medicaid dual status, home health care, type of discharge, and year of discharge. The 95% CIs are derived from SEs adjusted to account for clustering at the hospital service area based on the home zip code of the beneficiary.

[b] Statistically significant compared with TCM ($P < .001$).

in the month following TCM services is lower when provided by a primary care physician than when provided by a specialist, even after controlling for differences in types of cases.

Clinicians participating in Medicare ACOs[12] are disproportionately more likely than those who are not to provide TCM services following an eligible discharge. These clinicians may have a greater sensitivity to performance and cost-saving strategies that are less pervasive outside of alternative payment model arrangements.[16] Our findings suggest that the total cost and mortality benefits of TCM services are not limited to patients treated by clinicians who participate in an ACO.[12]

Limitations

This study has several limitations. Follow-up was only a month after the potential provision of TCM services. It is possible that the mortality and cost benefits would dissipate with a longer observation period. However, we found strong associations in the immediate period following the TCM service, and it may be more likely that these findings are related to the delivery of the TCM services.

Since a clinician can only bill for TCM services 30 days after an eligible discharge, we could not determine from the administrative claims whether TCM services might have been provided to patients who died within 30 days of an eligible discharge. If mortality in the first 30 days following an eligible discharge was higher among those who received TCM services, we may have a biased estimate of the benefit of TCM services. We mitigated this bias by only comparing the mortality and costs of Medicare beneficiaries during the 31 to 60 days following an eligible discharge.

The benefits we observed for TCM services may reflect differences in the patient population or the quality of clinicians who were early adopters of this service. We adjusted for observable differences in the characteristics of patients who did and did not receive TCM services. It may be that beneficiaries who are motivated to accept TCM services are also the same ones who would, independent of receiving TCM services, be less likely to die or develop complications after discharge that would require a high-cost intervention.

Finally, because we analyzed administrative billing records and not more detailed medical records, we cannot say which aspect of TCM services resulted in the observed cost and mortality benefits. Other studies have suggested that a variety of interventions, including patient and caregiver engagement, standardized transition plans and forms, standardized training of the care transition staff, and timely follow-up after the patient is discharged from the medical facility, may contribute to improved outcomes.[17] Our finding that there was a stepwise benefit progressing from no TCM without an office visit to no TCM with an office visit and to TCM services suggests that there are independent benefits for contacting the patient soon after an eligible discharge and for an office visit shortly thereafter.

Conclusions

We found that TCM is a promising delivery model innovation that has the potential to improve health outcomes and costs among Medicare beneficiaries discharged to the community from medical facilities. Three years after implementing a payment code for this service in the Medicare fee schedule, the interest was growing but quite slowly. A similar trend is emerging for the Centers for Medicare and Medicaid Services chronic care management payment code, which also reimburses clinicians for non-face-to-face services.[18] To encourage wider use of chronic care management, the Centers for Medicare and Medicaid Services has increased the reimbursement and relaxed some of the administrative burden associated with billing for this service.[19] A similar approach may be needed to encourage an increase in the appropriate use of TCM services. An assessment should be made regarding a reduction in the administrative burden associated with billing for TCM services, such as allowing clinicians to bill for TCM services at the time of an office visit rather than waiting 30 days following an eligible discharge. Future consideration should also be given to the amount paid for TCM services and whether it provides an adequate incentive to change community-based practice.

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