

Effects of an Integrated Medication Therapy Management Program in a Pioneer ACO

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ABSTRACT

OBJECTIVES: The objectives of this study were to: (1) assess the effects of an integrated medication therapy management (MTM) program for accountable care organization (ACO) patients on all-cause hospitalization rates, (2) evaluate the impact on 30-day hospital readmission rates for the ACO patients, and (3) assess the effect of an integrated MTM program on per capita Medicare parts A, B, and D costs for ACO patients.

STUDY DESIGN: A quasi-experimental nonequivalent design compared utilization and costs for ACO patients in an MTM program with those of patients in a Medicare Shared Savings Program (MSSP) but not an MTM program.

METHODS: The integrated medication management program linked a network of community pharmacies with ACO practitioners. Analyses included Medicare parts A and B claims data from January 1, 2013, through December 31, 2014, with a 9.5-month baseline period and a 14.5-month intervention period. The outcome variables were all-cause hospitalization rate (per 30 days), 30-day hospital readmission rate (per 100 discharges), and average monthly per capita costs for Medicare parts A and B. Longitudinal analyses (generalized estimating equations) were used to compare across groups and over time, controlling for age, gender, and race.

RESULTS: Data comparing 885 ACO patients with 642 MSSP patients showed significant decreases in hospitalization rates and Medicare costs over time, but no significant differences across the groups. No significant decreases were found in 30-day readmission rates.

CONCLUSIONS: An integrated medication management program was associated with lower hospitalization rates and costs of care over time, although these reductions were not significantly different from decreases found in a comparison MSSP group.

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Accountable care organizations (ACOs) have been stimulated by the Affordable Care Act, which prompted CMS to utilize ACOs to reform Medicare payments.¹⁻³ Although ACO performance measures include quality and cost indicators, another important area that can affect the performance of an ACO is medication therapy, which is commonly used to manage chronic conditions. Whereas safe and effective medication therapy can keep patients out of the hospital and help control total healthcare costs,⁴ unsafe medication use, medication nonadherence, and drug-related problems can lead to adverse drug events and associated increased healthcare utilization, such as emergency department and other hospital use.⁵ Many of the ACO performance metrics used by CMS directly involve specific medication therapy or the control of conditions through the use of medications.⁶

Some ACOs are employing pharmacists on care teams to address various medication-related issues, including reconciling medications at the time of hospital admission and discharge, helping to manage patients on high-risk medications, and serving on advanced care teams.⁷⁻⁹ Similarly, Medicare Part D plans provide required medication therapy management (MTM) programs to eligible beneficiaries, with such services often being delivered by community pharmacists.¹⁰ Community pharmacists are well positioned to deliver these services to help ACOs extend access to care for their patients. However, little has been published about engaging a network of community pharmacies in this manner

and how such a network may contribute to the performance of an ACO. The purpose of this study was to implement and evaluate an integrated MTM program in a Pioneer ACO.

Specific objectives of this study were to: (1) assess the effects of an integrated MTM program for ACO patients on all-cause hospitalization rates, (2) evaluate the impact on 30-day hospital readmission rates for the ACO patients, and (3) assess the effect of an integrated MTM program on per capita Medicare parts A, B, and D costs for ACO patients.

METHODS

Trinity Pioneer ACO, part of UnityPoint Health, is centered in Fort Dodge, Iowa, and serves about 10,000 rural patients primarily through Trinity Regional Medical Center and UnityPoint Clinics. Trinity Pioneer ACO provides numerous services to coordinate care and improve its patients' health outcomes, including a high-risk medical care team, integrated chronic care disease management, care at home following hospital discharge, and wound care and palliative care coordinated with long-term care facilities. In addition, a network of community pharmacies and an MTM program coordinator, OutcomesMTM, participated in the intervention arm of the study.

The service area of Trinity Pioneer ACO consists of 8 rural counties served by 32 community pharmacies. At the start of the study, 25 of these pharmacies agreed to participate in the MTM program and completed training in delivering and documenting MTM services on the OutcomesMTM platform. OutcomesMTM has extensive experience with coordinating community pharmacy networks to deliver MTM services, especially for Medicare Part D beneficiaries. Their online MTM platform was used to coordinate the MTM process among the ACO and the community pharmacy providers. The Human Subjects Office of the University of Iowa approved this study.

Randomization of patients, providers, or pharmacists to intervention and control groups was not feasible in this setting because providers and pharmacists were likely to provide services to many ACO members in their geographic region. If the intervention appeared to be useful to some, the risk of contamination, or "bleeding," of the intervention into a randomized control group was substantial. Thus, a comparison group was chosen to be very similar on key factors but in a nonoverlapping geographic region (ie, in a quasi-experimental nonequivalent groups design).

The comparison group was a rural Medicare Shared Savings Program (MSSP), also part of UnityPoint Health. Although the MSSP group did not have a specific MTM program, its coordinated care programs included patient-centered medical home models, an advanced medical care team, a long-term care team to improve transitions between hospitals and long-term care facilities, and the use of pharmacists to conduct medication

reconciliation with patients prior to hospital discharge. The Trinity Pioneer ACO began its care coordination programs about a year ahead of the MSSP group, which may have given the groups different baseline levels on some of the outcome variables. We attempted to adjust for such differences with our use of longitudinal analyses by comparing the magnitudes of change between the study groups.

The study goals were focused on the subpopulation of Medicare beneficiaries who were enrolled in the Pioneer ACO or MSSP programs, living in the community, and at risk of medication-related problems, such as use of high-risk medications, use of a large number of medications for chronic conditions, or those having fragmented care. The same algorithm, run on administrative data for the same time periods in both the ACO and MSSP, was used to identify eligible patients (ie, high-risk chronic care patients, often with substantial medication use).

The integrated MTM program utilized ACO hospital pharmacists and a network of community pharmacists to focus on the targeted patients with risk of medication-related problems, including patients using high-risk medications and those with fragmented care. The patients became eligible for MTM services in 2 ways: (1) High-risk chronic care patients were identified by study-defined algorithms run on clinical and drug utilization data (ACO chronic group) and (2) high-risk care transition patients were identified by medical center pharmacists at the time of discharge from Trinity Regional Medical Center (ACO referral group). ACO patients who were identified as eligible for the MTM program had their information entered into the OutcomesMTM platform.

The MTM platform was a secure Web-based system accessible by participating community pharmacists. Patients were assigned to their primary pharmacy, based on the percentage of drug claims filled by that pharmacy in the baseline period. Community pharmacists typically contacted an eligible patient via telephone about receiving an MTM service. The preferred mode for MTM service delivery was face-to-face, although telephone delivery was allowed. After a pharmacist conducted an MTM service, he or she could file a claim for payment using OutcomesMTM's platform.

The community pharmacists delivered MTM services intended to coordinate medication therapy, prevent or address drug-related problems, and avoid medication errors. Pharmacist actions in delivering MTM services could involve a recommendation to a prescriber to change a medication, adjust a dose, start a new medication, or administer a medication, as well as communication to clarify the directions for the medication therapy. Also, the pharmacist might work solely with the patient, such as by addressing medication nonadherence, managing adverse effects, or clarifying regimens. The primary services delivered were

comprehensive medication review (CMR), prescriber consultation, patient education and monitoring, and patient adherence consultation. In a CMR, a pharmacist evaluated the safety and effectiveness of all of the patient's medications and then developed a plan to address any drug-related problems that were identified. Patients were able to decline to participate in the MTM services, if they preferred.

The data for the analyses included Medicare parts A, B, and D claims from January 1, 2013, through December 31, 2014, for both the Trinity ACO chronic group and the MSSP comparison group. MTM services claims data were available for the ACO patients. The primary outcome variables were all-cause hospitalization rate (per 30 days), 30-day hospital readmission rate (per 100 discharges), and average monthly per capita costs for Medicare parts A, B, and D. Individual-level characteristics were modeled in the analyses to allow for person-level adjustments. Although most beneficiaries were enrolled in the ACO or MSSP for the entire study period, some were not. Such variability of time-in-study was integrated into the analyses. Due to the lack of a comparison group for the ACO hospital-referred study participants and, in many cases, the lack of ACO Medicare data, these high-risk care transition patients were not included in these analyses.

Descriptive statistics were calculated to summarize the study sample in both study periods. Longitudinal analyses (generalized estimating equations [GEEs]) were used to compare outcomes across groups and over time, controlling for age, gender, and race. The primary comparisons used all Trinity ACO chronic group patients (eligible for the MTM program) versus the MSSP group, whereas the secondary comparison used the subgroup of eligible patients who had an MTM claim versus the MSSP group. The time periods used in the analyses were a baseline preintervention period from January 1, 2013, through October 15, 2013, and an intervention period from October 16, 2013 (the start date of the integrated MTM program), through December 31, 2014. Poisson regressions were used to model all-cause hospitalization at the participant level and 30-day hospital readmission. Lognormal regressions were used to model monthly per capita costs for Medicare parts A, B, and D. All statistical analyses were performed in SAS version 9.4 (SAS Institute, Inc; Cary, North Carolina).

RESULTS

A total of 885 Trinity ACO patients met the eligibility criteria for the MTM program and had Medicare claims data available (Table 1). The comparison group consisted of 642 eligible patients who participated in the MSSP but did not have an MTM program available. Both groups had an average age of about 73 years, and slightly less than 60% in each group were female. For all of the outcome variables, the MSSP comparison group started out at baseline with higher (worse) outcome values than the ACO intervention group, which had the lowest (best) values during the intervention period (Table 2).

Table 1. Summary of the Study Sample

| | Total | Intervention Group | Comparison Group |
|---|-------------------|--------------------|------------------|
| Unique patients, n | 1527 ^a | 885 | 642 |
| Died during the intervention period | 130 | 78 | 52 |
| Died in 2013 | 28 | 6 | 22 |
| Baseline age, years ^b | | | |
| Mean (SD) | 73.37 (11.07) | 73.56 (10.88) | 73.10 (11.32) |
| Median | 75.00 | 75.00 | 74.00 |
| Range | 27-97 | 35-97 | 27-97 |
| Elderly at baseline, ^b n (%) | 1276 (83.56) | 736 (83.16) | 540 (84.11) |
| Female, n (%) | 895 (58.61) | 528 (59.66) | 367 (57.17) |
| Race, n (%) | | | |
| White | 1451 (95.02) | 861 (97.29) | 590 (91.90) |
| Nonwhite | 76 (4.98) | 24 (2.71) | 52 (8.10) |
| Had an MTM and Medicare claim, n (%) | – | 450 (50.85) | – |
| The MTM claims were successful | – | 270 (60) | – |
| Has 2013 data, ^c n (%) | 1289 (84.41) | 673 (76.05) | 616 (95.95) |
| Had Part A claim, n (%) | 1514 (99.15) | 877 (99.10) | 637 (99.22) |
| Preintervention period, n | 1265 | 655 | 610 |
| Postintervention period, n | 1478 | 846 | 632 |
| Had Part B claim, n (%) | 1519 (99.48) | 883 (99.77) | 636 (99.07) |
| Preintervention period, n | 1279 | 669 | 610 |
| Postintervention period, n | 1508 | 876 | 632 |
| Had Part D claim, n (%) | 1507 (98.69) | 866 (97.85) | 641 (99.84) |
| Preintervention period, n | 1268 | 653 | 615 |
| Postintervention period, n | 1505 | 864 | 641 |

ACO indicates accountable care organization; MTM, medication therapy management.

^aThose that did not have claims data were excluded from the total sample. The patients who were Trinity ACO referrals were also excluded for the purpose of comparison. Eleven patients who were dead before October 16, 2013, were excluded as well.

^bThe baseline date for calculating age and determining whether a patient was elderly was January 1, 2013. Patients were considered elderly if they were 65 years or older on that date.

^cThere were 238 people who did not have 2013 data: 212 in the intervention group and 26 in the comparison group. They were in the study only for 2014.

During about 15 months of operation, the integrated MTM program produced 1573 MTM claims for 607 patients, including both the Trinity ACO chronic group and the Trinity ACO (hospital) referral group. The most common MTM service was a CMR, with 360 claims. Community pharmacists worked with providers to manage drug therapy 249 times, which included changing a dose (n = 21), changing a medication (n = 35), stopping a medication (n = 52), starting a new medication (n = 59), and administering an immunization (n = 82). Sixty-six pharmacies filed claims for the integrated MTM program.

The longitudinal (GEE) analyses showed that, after controlling for age, gender, and race, significant decreases in all-cause hospitalization rate were seen in all 3 groups over time (eAppendix Table 1 [eAppendix available at ajmc.com]). The comparison group decreased significantly more quickly than did the Trinity ACO chronic group, but not when compared with the smaller ACO intervention group receiving MTM services. The GEE analyses for the 30-day readmission rate showed that the decrease in these rates was not significant for any of the groups (eAppendix Table 2). The log (cost + 1) of the monthly per capita parts A, B, and D costs decreased significantly in all 3 groups, although their rates of decrease did not differ significantly across the groups (eAppendix Tables 3-5).

DISCUSSION

Although the integrated MTM program in the rural Pioneer ACO was associated with significant decreases in hospitalization rates and Medicare costs, the rate of decrease was not significantly better than that seen in the comparison group, a patient group under an MSSP. However, for all of the outcome measures, the MSSP group had considerably higher outcome values at baseline than the ACO groups, leaving more room for improvement. For example, the average monthly per capita Medicare Part A costs at baseline were \$486.31 for the ACO chronic group, \$464.19 for the intervention subgroup with MTM claims, and \$942.54 for the comparison group. The ACO had been improving care coordination for more than a year longer than the MSSP group and had started the study with lower (better) outcome numbers. It is possible that the ACO had addressed relatively easy targets prior to the study period and was addressing more difficult challenges in its care processes during the study intervention period.

Conversely, the MSSP may have had relatively easier targets to address as it began to improve care coordination, which it pursued with its coordinated care programs. So although the integrated MTM program was associated with improved outcomes, it is difficult to say how much the MTM program contributed to the improvements given the differences at baseline between the study

Table 2. Means/Medians of Outcomes Variables*

| Variable | Intervention Group | Intervention Group With MTM Claim | Comparison Group |
|--|--------------------|-----------------------------------|------------------|
| All-cause hospitalization rate (baseline), % | 7.03 | 6.86 | 8.47 |
| All-cause hospitalization rate (intervention), % | 6.00 | 4.89 | 5.92 |
| 30-day hospital readmission rate (baseline), % | 19.13 | 18.44 | 22.12 |
| 30-day hospital readmission rate (intervention), % | 16.15 | 15.70 | 19.07 |
| Monthly Medicare Part A costs (baseline), \$ | 486.31 | 464.19 | 942.54 |
| Monthly Medicare Part A costs (intervention), \$ | 480.23 | 383.31 | 595.23 |
| Monthly Medicare Part B costs (baseline), \$ | 220.87 | 219.29 | 305.50 |
| Monthly Medicare Part B costs (intervention), \$ | 196.22 | 197.00 | 244.79 |
| Monthly Medicare Part D costs (baseline), \$ | 315.67 | 363.37 | 478.19 |
| Monthly Medicare Part D costs (intervention), \$ | 301.35 | 337.90 | 482.82 |

MTM indicates medication therapy management.

*All costs are median per capita monthly costs, and other values are means of monthly rates in each study period.

groups. The rate of improvement may have continued in the ACO group without the intervention or it may have reached a point where additional efforts or services, such as the MTM program, were needed to make further progress. By the end of the study, the monthly median parts A, B, and D costs in the ACO intervention group dropped to \$480.23, \$196.22, and \$301.35, respectively, whereas the corresponding medians in the MSSP comparison group were \$595.23, \$244.79, and \$482.82 (Table 2).

The integrated model in this study combined the efforts of hospital pharmacists within the ACO with services delivered by community pharmacists who were not formally part of the ACO. The integration process encompassed more than just the pharmacists, including numerous providers. The pharmacists in the different settings contacted (eg, by telephone) each other when needed, although the MTM platform was helpful in sharing some patient information. Also, the hospitalist providers established a telephone call line that could be used by the community pharmacists for questions about discharge patients. The hospital made a discharge medication list available via fax, when requested by community pharmacists, for discharged patients. A readily recognizable fax form also was developed for the community pharmacists to use with the clinics when communicating about the ACO patients. In addition to describing the MTM program to its providers, the ACO communicated about

it to eligible patients through a letter and brochure. A key to an ACO improving its coordination with community pharmacies is clear 2-way communication, starting with input when planning any programs through feedback about implementing and improving services involving community pharmacies.

The integrated MTM program resulted in the network of community pharmacists directly affecting medication therapy almost 250 times during the intervention period, which included 82 instances of identifying a need for and administering an immunization. The community pharmacists also worked with the local providers to change medications, adjust doses, and start and stop medications. Although data on specific outcomes of these changes were not available, it is meaningful that 2 healthcare professionals (pharmacist and provider) agreed that each change should be made. The intent of the integrated MTM program was to utilize community pharmacists to help coordinate care, specifically medication therapy. These changes in the medication therapy of the ACO patients show that the pharmacists were successfully engaged in helping to manage medication therapy. Thus, they extended the reach of the ACO in coordinating the care of its patients by identifying a need for medication change that was not initially seen by practitioners within the ACO.

The study MTM program for the Pioneer ACO had active engagement by 66 community pharmacies, which provided more than 1500 MTM claims for more than 600 patients. Community pharmacies are well positioned to work with ACO patients to help them take their medications safely and effectively. They are accessible to patients in need of MTM services and are familiar with their healthcare needs. In addition, community pharmacists often have information that other providers may not have, including information about medication adherence and family support, awareness of medications prescribed by other providers, and information about cash prescriptions, which do not appear in many prescription claims systems.

Although this integrated MTM program benefitted the ACO and its patients, the payment to the pharmacists in this study came from a research grant. Sustaining a successful program such as this one would require a way to pay pharmacists to spend time providing MTM services. Medicare Part D programs currently do so, although only 11% of beneficiaries in such plans actually received MTM services in 2012.¹¹ Similarly, ACOs could fund an integrated MTM program, perhaps using a fee-for-service (FFS) approach or a capitated approach. Currently, FFS is commonly used to pay for MTM services for Medicare Part D beneficiaries, so it is plausible that ACOs could use such a reimbursement mechanism for their patients. Alternatively, ACOs might adopt a capitated plan for paying for MTM services, in which pharmacies are paid for providing the MTM services outside of medication dispensing. Payment for dispensing would not be part of ACO coverage, but payment for MTM services would be.

Limitations

This study had some limitations. One was that a quasi-experimental design was used. Without randomization, some influences within the 2 care systems may have been different between the ACO and comparison groups. For example, it is possible that the clinics in the ACO differed in some of their medication-related processes compared with the clinics serving the MSSP group. Although the same criteria were used to select the patients in both groups using administrative data, the groups could have differed in some ways that related to their hospital use and costs of care. Another limitation is that Medicare claims data were available for only a small number of patients discharged from the hospital into the MTM program (ie, high-risk care transition patients). At the start of the study, the hospital pharmacy staff did not have a reliable way to determine if a patient was in the ACO. Although an information flow process was developed over time, this problem resulted in a majority of the hospital discharge patients enrolled in the study actually not being ACO members. Thus, the ACO did not have Medicare claims data available to be analyzed.

CONCLUSION

In this study, an integrated MTM program in a Pioneer ACO was associated with lower hospitalization rates and costs of care over time, although these decreases were not significantly different from decreases found in a comparison MSSP group. The integrated MTM program also demonstrated the feasibility of developing a partnership between an ACO or MSSP organization with a network of community pharmacists. The community pharmacists improved the coordination of medication therapy by administering immunizations and recommending changes in dosing and medications for Medicare beneficiaries. The promising integrated MTM model should be used and further studied by other ACOs to refine it as a viable option for ACOs seeking to improve their performance metrics.

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eAppendix Table 1. GEE Poisson Analyses of All-Cause Hospitalization Monthly Rate

| Parameter | Intervention vs Comparison Group | | Intervention w/ MTM Claim vs Comparison Group | |
|----------------------|----------------------------------|----------------|---|----------------|
| | Estimate | Standard Error | Estimate | Standard Error |
| Intercept | -2.449** | 0.284 | -2.490** | 0.321 |
| Intervention* Time 2 | 0.243* | 0.113 | 0.0525 | 0.138 |
| Intervention | -0.234* | 0.099 | -0.230 | 0.119 |
| Time 2 | -0.337** | 0.072 | -0.333** | 0.0721 |
| Age at baseline | 0.0002 | 0.0037 | 0.0023 | 0.0043 |
| Female | 0.0186 | 0.0755 | 0.0085 | 0.0891 |
| White | -0.0667 | 0.165 | -0.182 | 0.174 |

GEE indicates generalized estimating equation; MTM, medication therapy management.

* $P < .05$.

** $P < .01$.

eAppendix Table 2. GEE Poisson Analyses of 30-Day Hospital Readmission Monthly Rate

| Parameter | Intervention vs Comparison Group | | Intervention w/ MTM Claim vs Comparison Group | |
|----------------------|----------------------------------|----------------|---|----------------|
| | Estimate | Standard Error | Estimate | Standard Error |
| Intercept | -1.173** | 0.389 | -1.453** | 0.398 |
| Intervention* Time 2 | -0.0273 | 0.191 | -0.0355 | 0.226 |
| Intervention | -0.179 | 0.153 | -0.170 | 0.181 |
| Time 2 | -0.224 | 0.122 | -0.227 | 0.122 |
| Age at baseline | -0.0075 | 0.005 | -0.0029 | 0.0052 |
| Female | 0.241 | 0.125 | 0.297* | 0.137 |
| White | 0.156 | 0.293 | 0.054 | 0.290 |

GEE indicates generalized estimating equation; MTM, medication therapy management.

* $P < .05$.

** $P < .01$.

eAppendix Table 3. GEE Lognormal Analyses of Monthly Per Capita Part A Costs^a

| Parameter | Intervention vs Comparison Group | | Intervention w/ MTM Claim vs Comparison Group | |
|----------------------|----------------------------------|----------------|---|----------------|
| | Estimate | Standard Error | Estimate | Standard Error |
| Intercept | 7.001** | 0.339 | 6.840** | 0.388 |
| Intervention* Time 2 | 0.182 | 0.119 | 0.101 | 0.142 |
| Intervention | -0.533** | 0.109 | -0.579** | 0.129 |
| Time 2 | -0.708** | 0.0764 | -0.707** | 0.076 |
| Age at baseline | 0.0008 | 0.0041 | 0.0042 | 0.0048 |
| Female | -0.0209 | 0.0905 | -0.0477 | 0.104 |
| White | -0.116 | 0.210 | -0.190 | 0.236 |

GEE indicates generalized estimating equation; MTM, medication therapy management.

^aLog(cost+1) was used in the generalized estimating equation analyses.

* $P < .05$.

** $P < .01$.

eAppendix Table 4. GEE Lognormal Analyses of Monthly Per Capita Part B Costs^a

| Parameter | Intervention vs Comparison Group | | Intervention w/ MTM Claim vs Comparison Group | |
|----------------------|----------------------------------|----------------|---|----------------|
| | Estimate | Standard Error | Estimate | Standard Error |
| Intercept | 6.167** | 0.198 | 6.147** | 0.226 |
| Intervention* Time 2 | 0.094 | 0.0629 | 0.116 | 0.0715 |
| Intervention | -0.307** | 0.0608 | -0.301** | 0.0669 |
| Time 2 | -0.674** | 0.0435 | -0.673** | 0.0436 |
| Age at baseline | 0.0023 | 0.0023 | 0.0021 | 0.0028 |
| Female | -0.160** | 0.0531 | -0.168** | 0.0619 |
| White | -0.177 | 0.128 | -0.134 | 0.139 |

GEE indicates generalized estimating equation; MTM, medication therapy management.

^aLog(cost+1) was used in generalized estimating equation analyses.

**P* < .05.

***P* < .01.

eAppendix Table 5. GEE Lognormal Analyses of Monthly Per Capita Part D Costs

| Parameter | Intervention vs Comparison Group | | Intervention w/ MTM Claim vs Comparison Group | |
|----------------------|----------------------------------|----------------|---|----------------|
| | Estimate | Standard Error | Estimate | Standard Error |
| Intercept | 9.381** | 0.236 | 8.829** | 0.256 |
| Intervention* Time 2 | -0.0379 | 0.0428 | -0.0853 | 0.0477 |
| Intervention | -0.513** | 0.0622 | -0.286** | 0.0642 |
| Time 2 | -0.414** | 0.0323 | -0.414** | 0.0323 |
| Age at baseline | -0.0364** | 0.0032 | -0.0291** | 0.0034 |
| Female | 0.116 | 0.0653 | 0.0618 | 0.0638 |
| White | -0.263* | 0.115 | -0.208 | 0.123 |

GEE indicates generalized estimating equation; MTM, medication therapy management.

**P* < .05.

***P* < .01.