Stimulating Comprehensive Medication Reviews Among Medicare Part D Beneficiaries

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ABSTRACT

Objectives: To assess the impact of a patient engagement intervention utilizing the Medication User Self-Evaluation (MUSE) tool on the completion percentage of comprehensive medication reviews (CMRs) among Medicare Part D beneficiaries.

Study Design: A case-control study.

Methods: Beneficiaries from 2 Medicare Part D plans were randomly assigned to 3 study arms (1 control arm plus 2 intervention arms for 2011 and 2012, respectively). Each beneficiary who participated in the MUSE intervention met 3 inclusion criteria and was matched with a single control group beneficiary based on: gender; age (within 5-year interval); plan type (ie, Medicare Prescription Drug Plan, Medicare Advantage Prescription Drug Plan); number of unique prescriptions; pharmacy medication therapy management (MTM) training status; and time period (2011, 2012). The outcome of interest was whether or not the beneficiary received a CMR in the 6 months following the index date. Generalized estimating equation (GEE) models were used to compare CMR percentages over time and between MUSE intervention groups. This study used MTM service claims data.

Results: The final sample of 1015 beneficiaries received MUSE intervention, of which 1007 were successfully matched to a control beneficiary. The estimated odds of having a CMR among those who received the MUSE intervention were 2 times that of their counterparts ($P = .0048$) across both study years.

Conclusions: Given the strong evidence found for a positive association between participation in a CMR and the MUSE intervention, Part D plans could use the MUSE to engage targeted beneficiaries in using pharmacist-provided MTM services.

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Medicare Part D plans have been required to offer medication therapy management (MTM) programs to eligible enrollees since 2006.[1] CMS has expanded the scope of MTM services since then, further acknowledging the benefits of avoiding drug-related problems, optimizing medication outcomes, and decreasing healthcare costs.[2] Currently, the comprehensive medication review (CMR) serves as a fundamental component of that expansion, as Part D plans must offer an annual CMR to all eligible MTM program enrollees.[3] An annual CMR must involve an interactive review and consultation that cover all of a beneficiary's medications obtained through contact with a pharmacist or other qualified provider.[3,4]

Despite this requirement, the participation in CMRs has been lower than anticipated. The national median CMR completion rate among MTM eligibles was only 10.9% based on the 2014 display measure report, using the 2012 performance data submitted by Part D plans.[5] CMS has attempted to improve the situation by imposing additional requirements, including the use of a 3-component standardized format—a CMR cover letter, a medication action plan, and a personal medication list—for a written summary of CMR results, setting the CMR completion rate as a display quality measure for plans, and possibly applying the CMR completion rate to Star ratings for drug plans in 2016.[4,6-9] Still, the policy changes alone have had limited effect on engaging Part D beneficiaries to use CMRs, because they regulate the activity of plan sponsors but not the behavior of beneficiaries.

One barrier to CMR participation revealed in previous studies is that the majority of eligible Medicare Part D beneficiaries are unaware of or do not understand MTM services. These factors result in relatively low expectations of personal benefit from such services, including CMRs, and underscore the importance of finding effective ways to encourage beneficiaries to participate in MTM services.[10-15] Recently, in exploring Australian patients'

utilization of Home Medicines Review (HMR)—a pharmacist-provided service available in Australia for patients' medication assessment—Carter et al[16-18] found that increased patient expectations of receiving useful medication information can motivate eligible patients to use that service. Although many of the details of HMR differ from CMR, the two are similar in that a pharmacist conducts a comprehensive interview with the patient about their medications. The findings of Carter et al are informative to us: it is likely that highlighting the CMR as a valuable medication information source would stimulate Medicare beneficiaries' engagement in MTM services. Also, the literature has shown that patients generally seek more health information than what they receive[19-21]; specifically, they would like information that is tailored to them during their physician visits,[21] which could translate to getting medication information in a CMR during a pharmacy visit.[22,23] These findings suggest the importance of exposing Part D beneficiaries to personalized information regarding eligibility and potential benefits from the CMR. Offering such personalized advice may require direct input from Part D beneficiaries, such as health information and behaviors. It is insufficient to rely solely on prescription claims, as Medicare Part D plans often do.

Motivated by these findings, a patient engagement intervention was implemented as part of an MTM quality improvement project. The intervention utilized the Medication User Self-Evaluation (MUSE) tool (**Figure**), which was validated to be useful in targeting MTM services among Medicare Part D beneficiaries by estimating their likelihood of benefiting from the services.[24] The MUSE incorporates 7 items as a self-reported questionnaire: it asks about the number of medical conditions; whether the patient has forgotten to take medications; if cost-related issues exist regarding prescriptions; if there have been hospitalizations in the past 6 months; and the number of prescribed medications, physicians, and pharmacies utilized. Part D beneficiaries' responses were used to provide their own likelihood of benefiting from a CMR. It was expected that calling Medicare beneficiaries to complete the MUSE would stimulate them to seek a CMR if they were given feedback to expect a benefit from a CMR.

Objective

The objective of this study was to assess the impact of the MUSE intervention on the completion percentages of CMRs among a cohort of Medicare Part D beneficiaries.

Take-Away Points

Among Medicare Part D beneficiaries, the low uptake of comprehensive medication reviews (CMRs) remains a concern. To our knowledge, there has been limited effective stimulation of beneficiaries to seek CMRs. This study assessed the impact of a Medication User Self-Evaluation (MUSE) intervention tool designed to engage beneficiaries' use of CMRs.

- The MUSE tool was found to be associated with a higher completion rate of CMRs, providing significant empirical evidence of the importance of enhancing awareness and applying personalized information.
- It is feasible that the MUSE tool can be used by Part D plans and other stakeholders to help engage targeted beneficiaries to use such pharmaceutical services.

METHODS

Study Design & Setting

OutcomesMTM, an MTM program administrator, provided a sampling frame of eligible Medicare beneficiaries and staff for the implementation of the MUSE intervention. OutcomesMTM has extensive experience in MTM program administration, having administered pharmacist-delivered clinical intervention programs for more than 10 years, covering more than 5 million patients. The pharmacists in OutcomesMTM's network have been trained to deliver MTM services, identify potential drug therapy problems, and take steps to resolve such issues using a secure Web-based documentation and billing platform. The participant pharmacies and beneficiaries in this study were from 2 of OutcomesMTM's Medicare Part D clients: a Medicare Prescription Drug Plan (PDP; ie, Plan A) and a Medicare Advantage Prescription Drug plan (MA-PD; ie, Plan B). The eligibility criteria for both plans were consistent over the study period.

The study design was a case-control study implemented in 2011 and 2012. The MUSE intervention cases were 2 targeted subsets—1 in 2011 and 1 in 2012—randomly selected to be offered the MUSE intervention, while controls were matched from a control arm. Both cases and controls received the usual MTM services through OutcomesMTM's program, but only the intervention group was offered the MUSE. Two time periods allowed separation of temporal effects from study intervention effects.

Within the larger sampling frame of beneficiaries, only those who met 3 inclusion criteria were selected randomly to receive the MUSE intervention; criteria included being 65 years or older, having received at least 12 prescription fills of any medication during a 6-month pre-intervention period (April 1 to September 30 in 2010 or 2011), and having been continuously enrolled during the time frame of interest (2 prescription fills at least 150 days apart).[25] This

Figure. The 7-item Medication User Self-Evaluation Tool[24]

1. How many prescription medications do you take regularly? (Fill in reported number)
2. During the past month, have you forgotten to take your medication(s) for any reason? (Yes/No)
3. In the past year, have you not filled a new prescription or stopped taking a prescription medication because of the cost? (Yes/No)
4. In a typical month, from how many pharmacies do you get prescriptions, including mail order? (Fill in reported number)
5. Have you been admitted into a hospital in the past 6 months? (Yes/No)
6. How many physicians have prescribed medications for you in the past year? (Fill in reported number)
7. Please tell me the number of medical conditions for which you are receiving treatment. (Fill in reported number)

ensured that beneficiaries were eligible for a CMR under Medicare Part D, were continuously enrolled through the monitoring window, and were taking several medications for chronic conditions. The final targeted sample sizes for the MUSE intervention were 2843 beneficiaries in 2011 and 3247 in 2012. The study was approved by the University of Iowa Institutional Review Board.

Intervention

The patient engagement intervention (ie, MUSE intervention) was designed to stimulate participation in CMRs among Medicare Part D beneficiaries. Beneficiaries in the intervention arms received a letter from OutcomesMTM describing MTM services, and notification of a patient engagement telephone call. Operationally, the contact process was done on a rolling weekly basis to notify beneficiaries of the phone call that they would receive within the upcoming week. The beneficiaries in the control arm were not contacted by study personnel during the study period. The week after the mailing, outreach personnel at OutcomesMTM called beneficiaries, primarily during the day. If a contacted beneficiary agreed to participate, the outreach staff member and beneficiary worked through the MUSE tool together during the phone call.

The call script was programmed into a Microsoft Access database, which also collected the beneficiary's responses during the call. Access was programmed to immediately predict the likelihood of benefit from receiving a CMR (ie, low, moderate, and high), using beneficiary responses and a validated prediction equation.[24] The beneficiary was told their predicted category and given specific information on getting a CMR, though CMR appointments were not made during the call. It was the beneficiary's choice to decide whether or not to take the next step to schedule a CMR on their own with their local pharmacist.

Matching Process

Using de-identified claims data, each beneficiary who participated in the MUSE intervention was matched to a single control beneficiary from the same time period (2011 or 2012) from the control group who did not receive the outreach phone call with the MUSE tool. Using information on prescription fills and demographics from OutcomesMTM, an exact match was required for plan, number of unique prescriptions, pharmacy training status, and gender, while age was matched to within 5 years. This process used a greedy algorithm and was conducted for each time period. When multiple matches were found, 1 was randomly selected and the remaining ones were returned to the candidate pool.

Only pharmacies in OutcomesMTM's pool that are designated as "trained and contracted" are able to bill for CMRs; thus, MTM training is an important factor on which to be matched when evaluating the effect of the MUSE on CMRs. A beneficiary was considered associated with a trained and contracted pharmacy if they had obtained at least 1 prescription in the year of interest from such a pharmacy.

Outcome

The study outcome was whether or not the beneficiary received a CMR in the 6 months following the index date. For the intervention arms, the index date was the date of the telephone contact in the MUSE intervention. Matched beneficiaries from the control arm were given the same index date so that the pair would be monitored for a CMR in the same 6-month period. The chosen observation window was assumed to give potential beneficiaries sufficient time to complete a CMR if they wanted to do so, but not so long as to become unrelated to the MUSE intervention. The intervention year was incorporated to allow assessment of change in environment over time. CMRs performed outside the 6-month window were not counted.

Data Analysis

Generalized estimating equations were used to model CMR percentage over time and between those who did and did not receive the MUSE intervention, incorporating correlation due to the matching. The MUSE intervention indicator was 1 if the beneficiary received the

Table 1. Description of Matched Intervention and Control Groups

	Intervention (n_1 = 1007)	Control (n_2 = 1007)
Age[a]		
Mean (SD)	78.34 (6.93)	80.20 (6.75)
Range	65.72-99.97	66.05-100.87
Gender, n (%)		
Male	306 (30.39)	306 (30.39)
Female	701(69.61)	701 (69.61)
Claim Group, n (%)		
Plan A (PDP)	665 (66.04)	665 (66.04)
Plan B (MA-PD)	342 (33.96)	342 (33.96)
Number of Rx[b]		
Mean (SD)	9.17 (4.34)	9.17 (4.34)
Range	2-32	2-32
MUSE intervention year, n (%)		
2011	343 (34.06)	343 (34.06)
2012	664 (65.94)	664 (65.94)

MA-PD indicates Medicare Advantage Prescription Drug Plan; MUSE, medication user self-evaluation; PDP, Medicare Prescription Drug Plan.
[a]Age is calculated as of January 1, 2011.
[b]Number of Rx is the number of unique prescriptions in the 6-month period.

intervention, and 0 if they did not. Year was also treated as a binary variable, set to 1 for 2012 and 0 for 2011. Two-way interactions were explored. The logit link and binomial distribution for the outcome were assumed. All statistical analyses were performed in SAS version 9.3 (SAS Institute, Cary, North Carolina).

RESULTS

In 2011, 348 MUSE records were received by the study analytic team from OutcomesMTM. This reflected a 12.2% acceptance rate of MUSE intervention (ie, responding to the MUSE questionnaire) among the initial sample (n = 2843). In 2012, 667 MUSE records were received, representing a 20.5% acceptance rate among the sample (n = 3247). Reasons for the low acceptance rate reflected several issues. According to records of those making MUSE phone calls, nearly half of the study sample could not be reached (eg, their registered telephone number was no longer correct or they were not home to answer the call). Voicemail messages were left for those who had answering machines, and if the beneficiary did not respond by returning the call after 2 messages were left, they were deemed to have opted out of the study. Some individuals who answered the phone simply chose not to participate and opted out at that time.

Excluding those who opted out or could not be reached, the final sample size of those who participated in the MUSE intervention was 1015, of whom 1007 were successfully matched to a control beneficiary (Table 1). Relaxation of the matching criteria was only moderately successful in matching the other 8, so they were eliminated from the analyses. There were 343 and 664 matched beneficiaries in the 2011 and 2012 groups, respectively. Of those, 4.77% (n = 48) of the intervention group and 2.38% (n = 24) of the control group had a CMR in either 2011 or 2012.

Using the quasi-information criterion for model selection,[26] the interaction of intervention/control with year was dropped. Thus, in the final model, the likelihood of having a CMR was modeled as a function of receiving a MUSE intervention and the intervention year, with no interaction. This implied that the interaction term was not needed, as the effect of time did not differ across the 2 groups.

Based on this model, the estimated odds of having a CMR among those who received the MUSE intervention were double that of their corresponding control beneficiaries (P = .0048), across both study years (Tables 2 and 3). In 2011, 2.33% of the MUSE intervention participants had a CMR in the 6-month observation period, whereas 0.58% of the control group beneficiaries had one, resulting in an observed odds ratio of 4.09. In 2012, 6.02% of the beneficiaries in the MUSE intervention had a CMR, whereas 3.31% of the control group did so, resulting in an observed odds ratio of 1.87. Since the yearly odds were not signifi-

Table 2. Impact of the MUSE Intervention on the Completion Percentage of CMRs; Final GEE Model Parameters

	Estimated Coefficient	Odds	95% CI Limits
Intercept	–4.6381	–	–
MUSE intervention: yes vs no	0.7226	2.06	1.25-3.40
Year MUSE intervention initiated: 2012 vs 2011	1.2023	3.33	1.70-6.51

CMR indicates comprehensive medication review; GEE, generalized estimating equation; MUSE, medication user self-evaluation.
n = 1007 matched pairs. Intervention-control pairs were matched on Medicare plan (Plan A/Plan B), number of unique prescriptions, gender, pharmacy training status, and age (matched within 5 years).

cantly different, the modeled pooled estimate of the odds ratio of the MUSE intervention over control was 2.06.

A large increase in the odds of having a CMR was seen between 2011 and 2012 in both study groups. The odds of having a CMR in 2012 were estimated to be more than 3 times the odds of doing so in 2011 ($P = .0004$), across both groups. Members of the control group had observed odds of having a CMR in 2012 that were 5.87 times larger than the corresponding odds in 2011. In the MUSE intervention group, the observed odds of a CMR were 2.69 times higher in 2012 than in 2011. The final model estimate, which combines information in the intervention and control groups, was an odds ratio of 3.33 for the year of 2012 over 2011.

DISCUSSION

In this study, the delivery of the MUSE was associated with a higher completion percentage of CMRs, implying that the MUSE intervention engaged beneficiaries in seeking a pharmacist-provided medication review. Three possible explanations for this association can be considered: first, the MUSE intervention includes interactive communication between outreach personnel and the beneficiaries. The interactive communication is deemed to be more compelling than 1-way communication, encouraging participants to pay closer attention and to remember more of the information that was delivered.[27] Similarly, the MUSE intervention would be more noteworthy to the beneficiaries than a general promotional activity such as a flyer introducing the CMR service. Interpersonal contact could increase the likelihood that beneficiaries become aware of the CMR during the MUSE intervention, which could stimulate future CMR participation.

Second, earlier research showed that interventions tailoring information to individuals are more effective than untailored ones in promoting health behavior change.[28-30] Such tailoring could contribute to the effectiveness of the MUSE intervention, given that MUSE recipients received personalized advice about their potential to benefit from receiving a CMR. As such, the advice—versus nonpersonalized advice—would be more meaningful during the period when beneficiaries were deciding whether or not to obtain a CMR. This is also supported in a study by Tang and colleagues,[21] suggesting that individually tailored information is most welcome to patients.

Third, through the MUSE phone call, beneficiaries' expectations of benefiting from a CMR could enhance their willingness to receive a CMR, and in turn stimulate their engagement in such pharmacist-provided medication review services. Having perceived value from a health service mirrors the recent findings of an Australian research group.[16-18] By introducing the CMR as a low-cost medication information resource, the MUSE intervention may have led beneficiaries to expect an outcome of reduced medication concerns through participation in a CMR in the future.

It was observed that the overall CMR percentage increased from 2011 to 2012. One explanation for this may be the influence of CMS on Medicare plans. CMS has implemented a series of policy changes for MTM programs, focusing on Medicare plans; these changes include the obligation to offer an annual CMR, the requirement of using a standardized format for giving patients a summary of the CMR, and the inclusion of the CMR completion rate as a display quality measure in Star ratings going forward. These policy changes emphasized the importance of CMRs so that plans would pay more attention to promoting them. In addition, pharmacies that have contracts with multiple Part D plans would have seen increased demand for CMRs, and consequently expanded their CMR capacity.

Another potential explanation focuses on interpersonal influence by physicians, friends, or family members. General practitioners' social influence has been found to affect patients' acceptance of such medication review services in Australia.[18] The strong relationship between a patient and physician, involving high levels of trust, could have a direct influence on patients' health behaviors. Specifically, if the physician promoted the usefulness of pharmacist-provided

Table 3. CMR Percentages: Observed and Predicted With 95% CIs From Final GEE Model

	Predicted CMR Percentage (95% CI)	Observed CMR Percentage
MUSE intervention group, 2011	1.95 (1.02-3.71)	2.33
Control group, 2011	0.96 (0.49-1.86)	0.58
MUSE intervention group, 2012	6.22 (4.68-8.23)	6.02
Control group, 2012	3.12 (2.06-4.69)	3.31

CMR indicates comprehensive medication review; GEE, generalized estimating equation; MUSE, medication user self-evaluation.

medication review services, the patient would be more likely to believe that participation in a CMR is beneficial. With the recent growth of MTM services, it is believed that physicians became more supportive, which in turn increased patients' overall acceptance of the CMR over the 2 years. As more and more beneficiaries experience CMRs, they might talk to their family members or friends about the benefits of such services.[31] These positive word-of-mouth messages could have contributed to the observed increased CMR percentages as well.

The 7-question MUSE tool was effective in collecting helpful patient-reported information within a short period of time. Having such tailored information can improve the quality and efficiency of the interactive communication between the outreach personnel and the beneficiaries. Thus, the use of tools, such as the MUSE intervention, is promising for stimulating medication reviews in the future due to their potential to improve the efficiency and personalization of interactive communication through standardized interventions.

Limitations

As with any study, some limitations exist. Only 2 Medicare Part D plans were included, which restricts the generalizability of the findings, though one was a PDP and the other was an MA-PD. Also, some beneficiaries could not be invited to participate in the MUSE intervention because the available contact information was either not current or inaccurate. Such poor maintenance of accurate contact information reinforces the importance of updating patients' details in a timely manner to support likewise timely outreach activities. Additionally, beneficiaries were responsible for scheduling a CMR themselves with the local pharmacist; even if the MUSE score indicated a high likelihood of benefiting from a CMR, while they might have fully intended to do so, some otherwise willing patients may not have made an appointment with the pharmacist after the MUSE call.

Future Research

Future research is needed in several areas. More beneficiaries from a variety of Medicare Part D plans could be examined to see if a patient engagement tool, such as the MUSE, stimulates participation in CMRs. For example, this study involved community pharmacists providing the CMRs. Some Part D plans rely only on their own pharmacists providing such services over the telephone. The use of the MUSE tool likely could help these plans target their telephone outreach.

Pharmacist-provided medication reviews, such as CMRs, have been promoted within the US healthcare system for several years. However, the low participation rate in CMRs implies a lack of engagement on the part of beneficiaries in choosing or accepting such services. This study suggests that incorporating an intervention like MUSE into the promotion of CMRs—by Part D plans, accountable care organizations, pharmacies, and other stakeholders—could be helpful in patient engagement. The MUSE tool used in this intervention could also assist these stakeholders to screen targeted beneficiaries by adding self-reported information into their screening process.

CONCLUSIONS

The MUSE intervention may be associated with participation in CMR services among Medicare Part D beneficiaries. In addition, the completion percentage of CMRs increased from year to year with the enhanced promotion of MTM services. The MUSE tool can be used by Part D plans and other stakeholders to assist in engaging targeted beneficiaries to receive pharmacist-provided medication reviews.

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