

# Impact of Telephonic Comprehensive Medication Reviews on Patient Outcomes

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Life expectancy has continued to rise over the past decades. It is estimated that the population of individuals in the United States older than 65 years will reach 83.7 million by 2050, twice this population in 2012.<sup>1</sup> Polypharmacy and chronic health conditions increase with age, prompting greater emphasis on safe and effective use of medications in the older adult population. This is one reason that CMS requires Part D sponsors to provide medication therapy management (MTM) programs to their beneficiaries.<sup>2</sup> The goal of MTM programs is to improve patient outcomes through drug therapy optimization, a reduction in adverse drug events, and patient empowerment.

Most MTM services are delivered either face-to-face or telephonically. The telephonic mode of delivery offers distinct advantages. First, a telephonic MTM session is easily accessible to patients. This allows patients in rural areas, those who are homebound, and those without transportation to receive the benefits of MTM services. Furthermore, telephonic MTM programs have the capacity to employ a team of pharmacists who can accommodate the needs of patients who speak English as a second language and are unable to find an MTM provider who speaks their language in a local setting. Another unique asset of telephonic MTM delivery is that patients can reach into their medicine cabinet and describe their prescriptions, OTC products, and supplements. During face-to-face sessions, pharmacists depend on patients bringing in their medications or recalling them from memory. Communication via telephone may also be more comfortable for certain patients, allowing them to broach personal questions or topics.

Telephonic delivery of MTM services, however, has certain challenges. The first barrier that must be overcome is establishing trust with patients. Some patients may be skeptical of the service or unwilling to discuss their medications over the phone. Another challenge is the reliance on verbal cues. Nonverbal cues can be useful to assess patient comprehension and well-being.

Telephonic MTM may not be ideal for every patient, but it is a welcome alternative for many. Although face-to-face MTM has been relatively well studied, its impact on patient outcomes is

## ABSTRACT

**OBJECTIVES:** The majority of studies on medication therapy management (MTM) have focused on the conduct of in-person comprehensive medication reviews (CMRs). Although face-to-face MTM services may be the most well-known mode of delivery, there are other ways CMRs can be implemented as part of an MTM service. Specifically, telephonic CMR is an alternative method of offering MTM services that many patients may welcome. The purpose of this commentary was to highlight current findings regarding the impact of telephonic CMRs as a component of MTM services on health outcomes.

**STUDY DESIGN:** Review of available literature analyzing the impact of telephonic CMRs on health outcomes.

**METHODS:** PubMed was used to identify studies published between January 1980 and December 2016 using the search terms *medication therapy management (MTM)*, *telephonic MTM*, *comprehensive medication reviews*, and *targeted medication reviews*. This search was limited to publications in English. Case reports were excluded.

**RESULTS:** CMRs conducted telephonically as part of an MTM program may potentially reduce healthcare expenditures, hospitalizations, and mortality.

**CONCLUSIONS:** Although study results have shown telephonic CMRs to be an effective way to enhance patient care and reduce healthcare expenditures, the components of telephonic MTM programs that make them most effective and the population on which they have the greatest impact are unknown. Moving forward, further evaluation of these programs is necessary to determine which specific factors, such as access to patient electronic health records, patient follow-up frequency, and the use of collaborative practice agreements, are most vital to improving patient outcomes.

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unclear.<sup>3</sup> Limited data are available regarding the effect of telephonic delivery on patient outcomes. The purpose of this commentary is to highlight current findings regarding the impact of telephonic comprehensive medication reviews (CMRs) as a component of MTM services on health outcomes.

The literature was obtained through PubMed from January 1980 to December 2016, using the terms *medication therapy management (MTM)*, *telephonic MTM*, *comprehensive medication reviews*, and *targeted medication reviews*. Case reports were excluded. The search was limited to publications in English. A CMR was defined as a comprehensive review of all medications being taken by patients to assess their appropriateness and targeted medication review as an assessment of appropriateness of a specific medication (eg, statins in patients with diabetes). The included studies are summarized in the [Table](#).

The impact of a telephonic MTM program on the health outcomes of home-based Medicare beneficiaries was explored in a prospective nonrandomized study.<sup>4</sup> Patients who opted into the MTM program and received a telephonic CMR were compared with a control group of those who opted out of the program and did not receive a telephonic CMR. The primary purpose of this study was to determine the impact of a telephonic MTM program on 180-day mortality as well as on inpatient hospitalizations, emergency department (ED) visits, and the cost of Medicare Part D covered drugs. Beneficiaries receiving MTM services were 50% less likely to die in the 180 days after the intervention compared with controls. However, they also were more likely to experience increases in both inpatient hospitalization and medication costs. There was no difference in ED visits between the 2 groups.

It should be noted that this study was not adequately powered to show a difference in inpatient hospitalizations, costs, or ED outcomes. Also, the study design created a potential for participation bias. Those who opted to receive the MTM service may have held their health in higher regard than ones who declined. Further, the pharmacists conducting MTM services had access to an electronic health record (EHR), which may not be available in other programs. Nonetheless, the telephonic MTM service demonstrated a significant decline in mortality.

Hui et al<sup>5</sup> determined the impact of a telephonic CMR on mortality over 1 year. This was assessed retrospectively in a large integrated health plan.<sup>5</sup> Medicare beneficiaries who received a telephonic CMR during 2006 to 2010 were matched to a control group of Medicare beneficiaries who were not eligible for MTM services and did not receive a CMR. In addition to the primary outcome of 365-day all-cause mortality, secondary outcomes included percentages of hospitalizations and ED visits and drug costs per day for the 365 days following intervention. Compared with the control group, there was a 14% reduction in the risk of death, a 3%

## TAKEAWAY POINTS

Medication therapy management (MTM) services have been implemented with the goal of enhancing patient outcomes through optimization of drug therapy and empowerment of patients to improve their health. Comprehensive medication reviews (CMRs), the principal component of MTM services, can be delivered face-to-face or telephonically.

- ▶ Telephonic delivery of CMRs expands the reach of MTM services.
- ▶ Study results have shown telephonic CMRs to be an effective way to enhance patient care and reduce healthcare expenditures.

reduction in the risk of hospitalization, and no difference in the change in median daily drug costs for beneficiaries who received the MTM services.

It is important to note that MTM pharmacists in this study had access to EHRs and were working under collaborative practice agreements, which may have provided them the opportunity to have a larger impact on the patients than in other telephonic MTM programs. With that considered, this study demonstrated positive effects of a telephonic MTM program on important health outcomes.

A relevant question is: Which groups of patients may receive the most benefit from telephonic MTM services? Zillich et al<sup>6</sup> evaluated the impact of telephonic MTM on hospitalization in Medicare patients newly admitted to home health care centers in a prospective randomized trial. Forty home health centers from across the United States were randomly selected. Eligible patients were block randomized to receive the MTM intervention or usual care. The patient population was composed of 64% admitted to home health care directly from an acute care hospital and 36% admitted from the community. Pharmacists completed a CMR and developed an action plan; a follow-up was done on day 7 and as needed for 30 days. The primary outcome of this study was 60-day all-cause hospitalization, and secondary outcomes included 30-day all-cause hospitalization and time to first hospitalization.

There was no significant difference between the 2 groups for any outcomes in the initial analysis. However, a planned post hoc analysis separated the participants into 4 groups based on baseline risk of hospitalization from the CMS risk score. An analysis of patients in the lowest-risk quartile found that those receiving a CMR were more than 3 times less likely to be hospitalized within 60 days, were more than 6 times less likely to be hospitalized within 30 days, and had a significantly longer time to first hospitalization compared with those not receiving a CMR.

Although the telephonic MTM intervention was not effective at reducing hospitalizations for the entire population, this study showed a marked reduction in the likelihood of hospitalization for patients in the lowest-risk quartile. This suggests that there may be a level of disease burden that renders the MTM intervention, by itself, insufficient. However, the intervention was effective for a population with a lower disease burden, which may have been more capable of managing their health with the assistance

## TRENDS FROM THE FIELD

**TABLE.** Outcomes Associated With CMRs as a Component of MTM Services

Study	Population/Setting	Size	Findings
Welch et al <sup>4</sup>	Home-based Medicare beneficiaries of Kaiser Permanente Colorado	Intervention (n = 459) Control (n = 336)	<ul style="list-style-type: none"> <li>• 50% reduction in risk of 180-day mortality compared with control (AOR, 0.5; 95% CI, 0.3-0.9)</li> <li>• Control more likely to experience inpatient hospitalization (AOR, 1.4; 95% CI, 1.1-2.0)</li> <li>• Control more likely to have increase in medication cost (AOR, 1.4; 95% CI, 1.1-1.9)</li> <li>• No difference in risk of ED visit (AOR, 0.9; 95% CI, 0.6-1.3)</li> </ul>
Hui et al <sup>5</sup>	Medicare beneficiaries of Kaiser Permanente California	Intervention (n = 34,532) Control (n = 124,546)	<ul style="list-style-type: none"> <li>• 14% reduction in risk of 365-day mortality compared with control (AHR, 0.86; 95% CI, 0.84-0.88; <i>P</i> &lt;.001)</li> <li>• 3% reduction in risk of hospitalization compared with control (AOR, 0.97; 95% CI, 0.94-0.99; <i>P</i> = .016)</li> <li>• 17% increase in risk for ED visit compared with control (AOR, 1.17; 95% CI, 1.14-1.20; <i>P</i> &lt;.001)</li> <li>• No difference in change in median daily drug cost</li> </ul> <p>2010 Cohort<sup>a</sup>:</p> <ul style="list-style-type: none"> <li>• 29% reduction in risk of 365-day mortality compared with control (AHR, 0.71; 95% CI, 0.68-0.75; <i>P</i> &lt;.001)</li> <li>• 9% reduction in risk of hospitalization compared with control (AOR, 0.91; 95% CI, 0.87-0.95; <i>P</i> &lt;.001)</li> <li>• 9% increase in risk for ED visit compared with control (AOR, 1.09; 95% CI, 1.04-1.13; <i>P</i> &lt;.001)</li> <li>• No difference in change in median daily drug cost</li> </ul>
Zillich et al <sup>6</sup>	Newly admitted home health patients in 40 home health care centers across the United States	Intervention (n = 415) Control (n = 480)	<p>All risk quartiles:</p> <ul style="list-style-type: none"> <li>• No difference in 60-day hospitalization (AOR, 1.26; 95% CI, 0.89-1.77; <i>P</i> = .19)</li> <li>• No difference in 30-day hospitalization (AOR, 1.22; 95% CI, 0.84-1.78; <i>P</i> = .30)</li> <li>• No difference in time to first hospitalization (AHR, 0.80; 95% CI, 0.60-1.06; <i>P</i> = .12)</li> </ul> <p>Lowest-risk quartile:</p> <ul style="list-style-type: none"> <li>• 3.78 times less likely to be hospitalized within 60 days compared with control (AOR, 3.78; 95% CI, 1.35-10.57; <i>P</i> = .01)</li> <li>• 6.82 times less likely to be hospitalized within 30 days compared with control (AOR, 6.82; 95% CI, 1.53-30.42; <i>P</i> = .01)</li> <li>• Longer time to first hospitalization compared with control (AHR, 0.3; 95% CI, 0.11-0.81; <i>P</i> = .02)</li> </ul>
Ward et al <sup>9</sup>	MAPD members of Humana	Intervention (n = 432) Control (n = 432)	<ul style="list-style-type: none"> <li>• 20.1% reduction in total healthcare expenditures compared with 2.3% increase in control</li> <li>• 30% reduction in medical expenditures compared with 1.1% increase in control</li> <li>• 5.4% increase in drug expenditures compared with 5.1% increase in control</li> </ul>
Moore et al <sup>10</sup>	Members of a large employer prescription benefit plan	Intervention (n = 2250) Control (n = 2250)	<ul style="list-style-type: none"> <li>• 10.3% (\$977) reduction in plan-paid healthcare cost compared with 0.7% (\$62) increase in control (<i>P</i> = .048)</li> <li>• 18.6% reduction in inpatient visits compared with 24.2% increase in control (<i>P</i> &lt;.001)</li> <li>• No difference in ED visits (<i>P</i> = .399)</li> <li>• 72.7 days average increase in days' supply compared with 111.1 day decrease in control (<i>P</i> &lt;.001)</li> <li>• 2.29% increase in hypertension medication MPR compared with 2.31% decrease in control (<i>P</i> &lt;.001)</li> <li>• 2.10% increase in dyslipidemia medication MPR compared with 2.61% decrease in control (<i>P</i> &lt;.001)</li> </ul>
Pindolia et al <sup>11</sup>	MAPD members enrolled with Health Alliance Plan	Intervention (n = 520) Control (n = 2161)	<ul style="list-style-type: none"> <li>• 17.2% reduction in total drug cost per member per month compared with 7% reduction in control (<i>P</i> = .001)</li> </ul>
Moczygemba et al <sup>12</sup>	Medicare Part D beneficiaries from Scott & White Health Plan in Texas	Intervention (n = 60) Control (n = 60)	<ul style="list-style-type: none"> <li>• Significantly more medication and health-related problems resolved compared with control (<i>P</i> = .0003)</li> <li>• No difference in adherence measure by MPR (<i>P</i> = .79)</li> <li>• No difference in total Part D drug costs (<i>P</i> = .80)</li> </ul>

AHR indicates adjusted hazard ratio; AOR, adjusted odds ratio; CMR, comprehensive medication review; ED, emergency department; MAPD, Medicare Advantage Prescription Drug; MPR, medication possession ratio; MTM, medication therapy management.

<sup>a</sup>The study conducted by Hui et al took place from 2006 to 2010. A post hoc subgroup analysis of patients enrolled in 2010 (noted as 2010 cohort) was performed due to significant changes in eligibility criteria for MTM services, resulting in a substantial increase in eligible beneficiaries for MTM programs in 2010.

of telephonic MTM. This was supported in a follow-up study by Gernant et al<sup>7</sup> that evaluated the effectiveness of a telephonic CMR as part of an MTM service on reducing 60-day all-cause ED utilization in Medicare home health patients. Overall, there was no statistical difference in ED utilization between the intervention group receiving the telephonic CMR and the control group. However, analysis of patients in the lowest-risk quartile showed that those receiving the telephonic CMR had significantly lower ED utilization. This may explain why there was no difference in 30-day hospital readmissions when comparing patients receiving a telephonic CMR with those who did not in the study conducted by Miller et al.<sup>8</sup> This study did not have strict exclusion criteria and included patients with disease states that put them at high risk for readmission, such as cystic fibrosis.

Ward et al<sup>9</sup> studied the impact of a telephonic MTM program on prescription, medical, and total healthcare expenditures among members of a Medicare Part D sponsor. A comparison of 9-month pre-intervention and 9-month postintervention all-cause total healthcare expenditures per participant demonstrated an association between provision of MTM services and healthcare cost savings. Participants receiving a telephonic CMR had an average savings in total all-cause healthcare expenditures of \$3680 per member.

The control group, which did not participate in the telephonic MTM program, had an average increase of \$393 per member. Interestingly, the difference in all-cause healthcare expenditures between the 2 groups was entirely due to the MTM program's impact on medical spending. The MTM group experienced an average decrease of \$3959 (30%), whereas the matched control group experienced an average increase of \$130 (1%) in medical spending. Both groups experienced an increase of about 5% in drug spending. Drug costs may have increased due to greater adherence or the optimization of therapeutic regimens, requiring the addition of doses or medications to a patient's therapy. The telephonic MTM program in this study significantly decreased healthcare expenditures compared with the control group.

Moore et al<sup>10</sup> studied the impact of a telephonic MTM program on plan-paid healthcare costs by performing a retrospective cohort study of eligible members matched by propensity scores. The intervention consisted of a telephonic CMR conducted by a pharmacist. Each patient received at least 2 more telephonic consultations within 12 months. In addition to plan-paid healthcare costs, the utilization of medical services, overall days' supply of targeted medications, and medication possession ratios (MPRs) were assessed. Plan-paid healthcare expenditures were significantly reduced among those receiving telephonic CMR compared with controls. The study group had a significant reduction in inpatient visits of 18.6% compared with an increase of 24.2% in the control group. However, there was no difference in ED visits between the 2 groups. The study group experienced an increase in average days of medication supply of 72.7 days compared with a decrease

of 111 days for the control group, as well as a significant increase in MPRs for hypertension and dyslipidemia compared with the control group. However, the follow-up consultations provided in this study may not be feasible for all MTM programs, limiting the generalizability of the results. This study demonstrated a model for an effective telephonic MTM program that significantly reduced healthcare expenditures and inpatient visits while increasing patient adherence.

Pindolia et al<sup>11</sup> retrospectively studied the impact of a telephonic MTM program on cost savings among Medicare Advantage Prescription Drug plan members. During 2006 and 2007, members of Michigan's Health Alliance Plan who opted into the MTM program were compared with those who declined. Although both groups had a significant reduction in drug costs per member per month for the 2006 plan year, members receiving MTM services had a greater reduction in drug costs compared with those who declined: 17.2% versus 7%. A 6-question survey revealed that more than 95% of patients found the service helpful and 90% reported the telephonic communication as convenient.

Moczygemba et al<sup>12</sup> studied the impact of a telephonic MTM program on the resolution of medication- and health-related problems (MHRPs), medication adherence, and Medicare Part D drug costs. Medicare Part D beneficiaries voluntarily enrolling in the MTM program and receiving a telephonic MTM consultation were compared with Part D beneficiaries who were eligible to participate in the MTM program but did not enroll. The control group was matched to the study group based on their number of Part D drugs and of chronic diseases. The telephonic MTM consultation consisted of a CMR provided by a pharmacist. MHRPs were identified by the pharmacists. A 6-month follow up using patient EHR and prescription claims determined recommendations that had been accepted and the number of MHRPs that were still present. A prescription claims history was used to measure total Medicare Part D drug costs and MPR to assess medication adherence.

MHRPs were reduced by 48% among those receiving the MTM consultation, which was significantly greater than the 14% reduction in the control group. However, medication adherence, as measured by MPR, did not increase as a result of the MTM consultation. In addition, the consultation did not significantly reduce Part D drug costs compared with the control group. This study's findings demonstrate that a telephonic MTM program can reduce MHRPs.

It should be noted that many contributing factors, including interventions performed by other providers, may affect the outcomes of MTM services.

## SUMMARY

Based on the review of published studies, telephonic MTM programs offering CMRs may significantly reduce mortality, hospitalizations,

and healthcare expenditures and enhance patient satisfaction and quality of life through drug therapy optimization. However, the addition of medications when needed to achieve optimal therapy and/or increased adherence may negate the cost-saving opportunities in some patients. Moving forward, further evaluation of existing telephonic MTM programs is necessary to determine which components of the program make it most effective. Increasing access to patients' EHRs, patient follow-up frequency, and the use of collaborative practice agreements may offer additional opportunities for improving patient outcomes. ■

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