

Effect of an Intervention to Increase Statin Use in Medicare Members Who Qualified for a Medication Therapy Management Program

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ABSTRACT

BACKGROUND: The cardiovascular (CV) benefits of lipid-lowering therapy in older adults with hypercholesterolemia and underlying risk factors for coronary artery disease (CAD) have been well documented. Significant reductions in the risk of myocardial infarction (MI) and coronary death have been demonstrated with statin therapy, benefits that are of particular relevance in patients with diabetes. Managed care interventions with prescribers have increased the use of selected drugs such as statins.

OBJECTIVES: To (1) measure the increase in new users of statins associated with the implementation of a statin initiation intervention aimed at prescribers for Medicare Part D Medication Therapy Management Program (MTMP) members with diabetes or CAD and (2) estimate the potential cost savings associated with the projected reduction in CV events based on published controlled trials.

METHODS: Medicare Advantage Prescription Drug (MA-PD) and prescription drug plan (PDP) members of a pharmacy benefits manager (PBM) were identified for the intervention who (1) met the criteria for MTMP (expected to incur at least \$4,000 in annual pharmacy expenditures for Part D-covered medications, filled at least 10 distinct Part D-covered medications, and had at least 3 of 5 chronic diseases of interest); (2) were identified as having diabetes or CAD (patients with a history of MI were considered to have CAD); and (3) had no pharmacy claims for a statin between January and June 2006. In August 2006, the primary prescribers for antidiabetic or CV medications of 1,144 identified members were sent educational materials and a report listing their patients with diabetes or CAD who were not receiving statin therapy. A comparison group of MA-PD members (N=700) with diabetes or CAD was identified who did not receive the intervention but who met all of the MTMP criteria except the presence of at least 3 of 5 chronic diseases of interest. Logistic regression was conducted to evaluate the intervention effectiveness after adjusting for age, gender, geography, and chronic disease score. To determine the implications of this intervention for routine practice, outcome measures included estimates of (1) the number of patient interventions necessary to prevent 1 major CV event and (2) the coronary event costs avoided by the intervention. The number of interventions necessary to prevent 1 major CV event was estimated by (1) calculating the number of members requiring interventions in order for 1 member to initiate statin therapy, based on the present study's findings, and then (2) calculating the number of statin initiations necessary to avoid a major CV event, based on clinical trial estimates of the effect of statin treatment on CV event rates.

RESULTS: During the 4-month period following the intervention, 12.1% (n=138) of the intervention members started a statin medication compared with 7.3% (n=51) of comparison members (P=0.001). After covariate adjustment, the odds of initiating a statin medication were 65% higher (adjusted odds ratio [OR]=1.65; 95% confidence interval [CI]=1.15-2.36; P=0.006) in the intervention than in the comparison group. The estimated number of members requiring interventions to prevent 1 major CV event was 220. The estimated coronary event cost avoidance is \$12,323 per 220 members who received the intervention, after subtraction of program administrative costs and the cost of statin drug therapy.

CONCLUSION: A statin initiation intervention aimed at prescribers for MA-PD and PDP members with diabetes or CAD who qualified for MTMP services was successful in increasing statin use among this group of members at high risk for CV events.

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What is already known about this subject

- Large cardiovascular (CV) outcome studies have shown significant reductions in the relative risk of death and major coronary events with the use of statins for secondary prevention. The PROspective Study of Pravastatin in the Elderly at Risk (PROSPER) trial demonstrated a 19% reduction in the risk of nonfatal myocardial infarction (MI) and coronary death with statin treatment in the elderly, and the Scandinavian Simvastatin Survival Study (4S) demonstrated a 34% reduction in the risk of coronary events in patients with coronary heart disease. The risk of coronary events was also significantly reduced in subgroups of women and patients of both sexes aged 60 years or older.
- Approximately one third of patients hospitalized with acute MI do not receive lipid-lowering medications at discharge despite the overwhelming weight of evidence in support of such therapy.
- Published information about programs to encourage appropriate use of statin medications is limited. In 1 randomized controlled trial, educational messaging delivered via rapid response e-mails to 14 primary care providers caring for 235 patients resulted in improved adherence to National Cholesterol Education Program (NCEP) guidelines, with statin prescription change rates of 15% for intervention patients versus 2% for controls at 1 month (P=0.001), and the median months to statin prescription change was 0 for intervention patients versus 7.1 for controls (P=0.005). In a subgroup of patients with low-density lipoprotein cholesterol (LDL-C) >130 mg per dL, the first post-intervention LDL-C level was lower for the intervention (119.0 mg per dL) than for the control (138.0 mg per dL) group (P=0.04).

Note: This article is discussed in an editorial on pages 563-70 of this issue.

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What this study adds

- A pharmacy benefit management company mailed educational materials to prescribers as part of a medication therapy management program (MTMP) in order to increase the use of statins among Medicare Advantage Prescription Drug (MA-PD) and prescription drug plan (PDP) members with diabetes or coronary artery disease (CAD) who had not filled prescriptions for statins in the previous 6 months.
- In a 4-month follow-up period, 12.1% of members whose prescriber received the intervention and 7.3% of a nonintervention comparison group of members with diabetes or CAD initiated statin therapy.
- The estimated number of patient interventions necessary to prevent 1 major CV event was 220. After subtraction of program administrative cost and the direct drug cost of statin therapy, the net cost avoidance associated with a reduction in coronary events was estimated at \$12,323 per 220 members.

The benefits of lipid-lowering therapy in patients with hypercholesterolemia and underlying risk factors for coronary artery disease (CAD) are well documented and are of particular importance in patients with diabetes.¹ Significant reductions in fatal and nonfatal cardiovascular (CV) events have been demonstrated in patients with and without CAD.²⁻⁵ Primary and secondary prevention of nonfatal myocardial infarction (MI) and CV death are the driving force behind the use of statins as a standard of care and the reason for their positioning as a first-line therapy in patients with hypercholesterolemia.¹⁻⁵

The West of Scotland Coronary Prevention Study demonstrated a 31% reduction in the risk of coronary events in patients with hypercholesterolemia but no past history of MI, while the Scandinavian Simvastatin Survival Study (4S) demonstrated a 34% reduction in the risk of coronary events in patients with coronary heart disease.^{2,3} The significant risk reductions seen in 4S extended to subgroups consisting of women and patients of both sexes aged 60 years or older. Separately, in the PROspective Study of Pravastatin in the Elderly at Risk (PROSPER) trial, the use of pravastatin was associated with a 19% reduction in the risk of nonfatal MI and coronary death.⁶ Clearly, the protective effect of statins is evident in patients across a wide range of ages and cholesterol values, regardless of gender.^{1,7,8} Meta-analyses of the numerous statin outcomes studies also underscore the value of lowering low-density lipoprotein cholesterol (LDL-C) and highlight a relationship between LDL-C reduction and decreases in the risk of coronary events.⁹ This relationship holds true in patients hospitalized with acute MI, a population in which the cost-effectiveness of secondary

prevention via statin-mediated LDL-C reduction has been amply demonstrated.^{2,3,7,10,11}

Up to 93% of post-MI patients require lipid-lowering medications after discharge despite intensive diet and exercise counseling and monitoring.¹² Nevertheless, a significant proportion of patients hospitalized with acute MI do not receive lipid-lowering medications at discharge despite the overwhelming weight of evidence in support of such therapy.¹³⁻¹⁶ Fonarow et al. found that only one third of patients hospitalized with acute MI were discharged on lipid-lowering medications as recorded in the medical record.¹³ A more recent analysis revealed that 37% of patients hospitalized with an acute coronary syndrome do not receive a statin after discharge.¹⁷ The cost of this oversight in terms of morbidity, mortality, and increased utilization of medical services has yet to be fully quantified, although the possibility of risk reduction alone clearly warrants the provision of care. In addition, the magnitude of benefit with lipid-lowering medications in this particular patient population matches or exceeds benefits associated with other secondary prevention medications such as aspirin, beta-blockers, and angiotensin-converting enzyme inhibitors.¹³

Special consideration should also be given to patients with diabetes because of a significantly increased risk of developing CV disease. Type 2 diabetes, which affects approximately 20 million Americans, is associated with atherogenic dyslipidemias and poorer prognoses once clinical CV disease develops. After lifestyle modifications, current guidelines from the American Diabetes Association (ADA) place the highest treatment priority on LDL-C reduction, followed by raising high-density lipoprotein cholesterol (HDL-C) levels and lowering triglyceride levels.¹⁸ Statins are considered first-line agents for reaching National Cholesterol Education Program (NCEP)/ADA LDL-C targets and have been shown to reduce major coronary events in patients with diabetes.^{6,8}

Currently, there is limited published information about clinical programs that successfully encourage the appropriate use of statin medications. However, Lester et al. conducted a prescriber-targeted intervention that was associated with significantly improved adherence to NCEP guidelines and lower LDL-C levels in the intervention cohort; the intervention leveraged electronic technologies to facilitate message dissemination and order entry and fulfillment.¹⁹ Similar mail-based programs may also be effective at modifying prescriber behavior and increasing appropriate utilization of statins in patients at risk for coronary events.

In order to increase the use of statins among members with diabetes or CAD, a national pharmacy benefit management (PBM) company implemented an intervention aimed at prescribers as part of a broader medication therapy management program (MTMP). This article describes the effect of this intervention with prescribers on increasing the initiation of statin therapy among MTMP members with diabetes or CAD.

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TABLE 1 Methodology for Identifying Diseases for MA-PD and PDP Members

Disease	Identification of MA-PD Members ^a	Identification of PDP Members ^b
Coronary artery disease	Hospitalization ^c or 2 outpatient physician encounters with an ICD-9-CM code in any diagnosis field of 414.0, 429.2, 411.xx, 413.xx or 410.xx; OR A medical claim with an ICD-9-CM procedure code of 36.01, 36.02, 36.05, 36.09, 36.1, or 36.2; OR A medical claim with a CPT code of 92980, 92981, 92982, 92984, 92995-92996, 33510-33516, 33517-33530, or 33533-33536	Member reported a history of coronary artery disease (CAD) or coronary heart disease (CHD) on a member questionnaire
Myocardial infarction	ICD-9-CM codes for myocardial infarction are included within the identification criteria for MA-PD members with CAD	Member reported a history of heart attack on a member questionnaire
Diabetes	Hospitalization or 2 outpatient physician encounters with an ICD-9-CM code in any diagnosis field of 250.xx, 357.2, 362.0, 366.41, or 648.0; OR A pharmacy claim with a GPI code of 2710, 2717, 2715, 2720, 2723, 2728, 2730, 2750, 2760, or 2799	Member reported a history of diabetes on a member questionnaire
Hypertension	2 outpatient physician encounters with an ICD-9-CM code in any diagnosis field of 401.xx-403.xx, 404.00, 404.02, 404.10, 404.12, 404.90, or 404.92	Member reported a history of high blood pressure on a member questionnaire
Hyperlipidemia	A medical claim with an ICD-9-CM code in any diagnosis field of 272.0, 272.1, 272.2, 272.3, 272.4; OR A pharmacy claim with a GPI code of 3910, 3920, 3930, 3940, 3945, 3950, or 3999	Member reported a history of high cholesterol, triglycerides, or lipids on a member questionnaire
Congestive heart failure	Hospitalization or 2 outpatient physician encounters with an ICD-9-CM code in any diagnosis field of 402.01, 402.11, 402.91, 428, 428.0, 428.1, 428.9, 404.01, 404.03, 404.11, 404.13, 404.91, or 404.93	Member reported a history of congestive heart failure or heart failure on a member questionnaire

^aDescription of the codes available from the authors upon request.

^bThe questionnaire asked members if they have ever been told by a health care professional that they had or have specific medical conditions. Wording in this column represents exact quotations from the questionnaire; for example, members were asked about "heart attack," not about "myocardial infarction."

^cHospitalizations were identified as medical claims with an inpatient place of service and at least 1 day length of stay.

CAD=coronary artery disease; CHD=coronary heart disease; CPT=Current Procedural Terminology; ICD-9-CM=International Classification of Diseases, Ninth Revision, Clinical Modification; GPI=Medi-Span Generic Product Identifier; MA-PD=Medicare Advantage Prescription Drug; PDP=prescription drug plan.

Methods

Program Description

Medicare Advantage Prescription Drug (MA-PD) and prescription drug plan (PDP) members who met the PBM's 2006 MTMP criteria were evaluated for the intervention. There were 3 qualification criteria for MTMP intervention: (1) likely to incur at least \$4,000 annual drug expenditure for Part D-covered medications, as assessed by Part D-covered medication expenditures during the first quarter of 2006; (2) at least 10 distinct Part D-covered medications identified by 10-digit Medi-Span generic product identifier (GPI) codes for prescriptions filled during the first quarter of 2006; and (3) at least 3 of 5 diagnoses of interest (i.e., hypertension, hyperlipidemia, CAD, congestive heart failure, and diabetes). For MA-PD members, disease conditions were identified using pharmacy and medical claims data during the 4 prior quarters (April 1, 2005, through March 31, 2006; Table 1).

Because medical claims data were not available for PDP members, disease conditions for PDP members were identified using

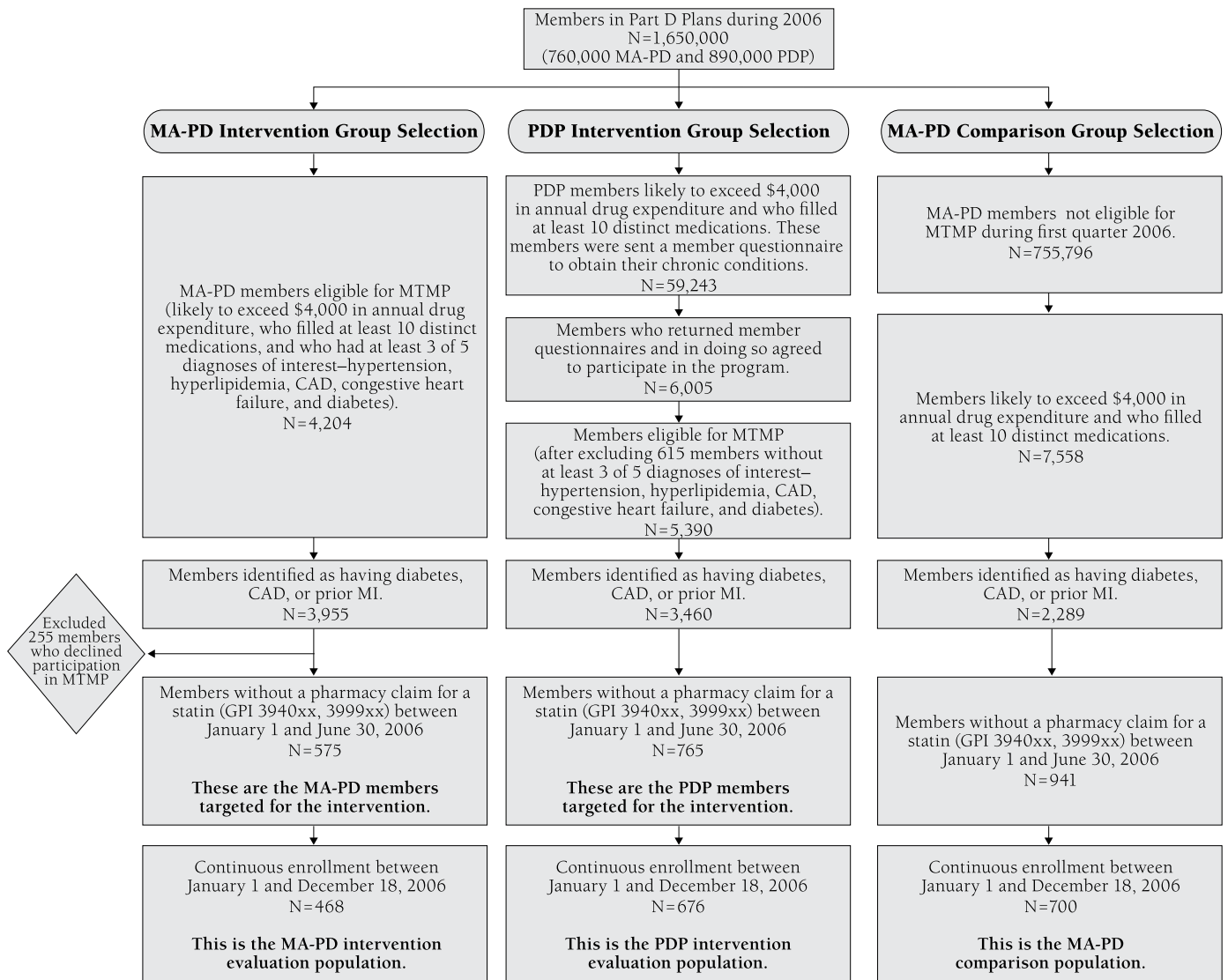
member-reported data obtained from a member questionnaire. The questionnaire was sent only to those PDP members who met the first 2 qualification criteria for the MTMP. To be eligible for the MTMP, the member must have returned the questionnaire and indicated that he or she had a history of at least 3 of the 5 diseases of interest. A comparison of the methodology used to identify disease conditions for MA-PD and PDP members is shown in Table 1.

After they were identified as meeting the 3 MTMP criteria, members were eligible for the intervention if they were identified as having diabetes or CAD (patients with a previous MI were considered as having CAD) and they had no pharmacy claims for a statin (GPI codes 3940xx or 3999xx) during the identification period (January 1, 2006, through June 30, 2006). Members were excluded from the intervention if they had previously declined to participate in the MTMP. A flowchart of the selection process is shown in Figure 1.

Criteria were developed to identify prescribers who received the intervention. For members with CAD, the most recent prescriber

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FIGURE 1 Selection of Members for the Intervention and Comparison Groups



CAD = coronary artery disease; GPI = Medi-Span Generic Product Identifier; MA-PD = Medicare Advantage Prescription Drug; MI = myocardial infarction; MTMP = medication therapy management program; PDP = prescription drug plan.

of any CV agent was identified. If no CV agents were prescribed, the most recent prescriber of any chronic medication was identified. For members with diabetes and members with diabetes plus CAD, the most recent prescriber of any antidiabetic medication was identified. If no antidiabetic medications were prescribed, the most recent prescriber of any chronic medication was identified.

A total of 1,340 members and 1,275 prescribers were identified for the intervention. On August 18, 2006, the identified prescribers were mailed a patient-specific report that highlighted the members under his or her care that could benefit from statin therapy. The report also included a section for prescriber feedback and a prescriber educational booklet on statin therapy.

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Program Evaluation

Electronic medical and/or pharmacy claims for members participating in MA-PD and PDP plans during 2006 were used to evaluate the intervention. Institutional Review Board (IRB) exemption certification was obtained from Independent Review Consulting, Inc., an external IRB, prior to conducting the analysis. To help interpret the impact of the program, a comparison group that did not receive the intervention was identified and was compared with the intervention group. Since all members who met the program's inclusion and exclusion criteria were targeted for an intervention, the comparison group was selected from MA-PD members who met all of the MTMP criteria except the presence of at least 3 of 5 chronic diseases of interest (i.e., hypertension, hyperlipidemia, CAD, congestive heart failure, and diabetes). Similar to the intervention group, the comparison group consisted of members with diabetes and/or CAD (including prior MI) but who did not have a pharmacy claim for a statin medication during the identification period (Figure 1).

Members were followed for the 4-month period following the date of the intervention (e.g., the follow-up period). Members were excluded from the analysis if they were not continuously enrolled with the health plan for the entire identification and follow-up periods (i.e., from January 1, 2006, through December 18, 2006).

The primary outcome of interest was the percentage of members who had a pharmacy claim for a statin medication during the follow-up period. Logistic regression was used to determine the likelihood of starting a statin in the follow-up period after controlling for possible confounding factors such as age, gender, geographic state, and Chronic Disease Score (CDS). The CDS, developed by Von Korff et al., was used as a measure of comorbidity and was calculated using pharmacy claims data from the identification period. The CDS is weighted based on the number of different chronic diseases under treatment, with a higher score representing a more severe burden of comorbidity.²⁰

To estimate the number of interventions needed to prevent 1 cardiac event, we first calculated (A) the number of members requiring interventions for our program to produce 1 statin initiation; this is the reciprocal of the difference between the statin initiation rates in the intervention and comparison groups. We then calculated (B) the number needed to treat with statins to avoid 1 major coronary event as the reciprocal of the improvement attributable to statin use based on findings from the 4S trial, where improvement was defined as the rate of major coronary events (e.g., coronary death, nonfatal definite or probable MI, silent MI, or resuscitated cardiac arrest) for a placebo group minus the rate for a statin-treated group.² We chose to use the 4S trial instead of the PROSPER trial,⁶ which measured cardiac event reduction in a group of patients aged 70 to 82 years because the PROSPER population was approximately 5 years older on average than our population (75 years vs. 70 years) and included some lower-risk patients than our population. Patients were required to have CAD, diabetes, or MI to be eligible for our intervention,

whereas patients with hypertension only or smoking history only were able to be enrolled in PROSPER. In PROSPER, only 44% of patients had vascular disease and 11% had diabetes, while all of our intervention population had either vascular disease or diabetes. The estimated number of members requiring intervention to prevent a cardiac event was the product of (A) × (B), where (A) is the number of interventions needed to produce a statin initiation, and (B) is the number of statin initiations needed to avoid 1 coronary event.

After estimating the number of interventions necessary to avoid a major coronary event, the costs avoided by conducting the intervention were calculated as (1) the cost of a major coronary event minus (2) the sum of the program costs plus the costs of statin treatment for a 5.4-year period (the median follow-up period for the 4S study) for the estimated count of members initiating a statin as a result of the program. Costs of a major coronary event were obtained from the literature, where the first-year costs following an acute MI or intermediate coronary syndrome have been estimated to be \$22,528, using 1999 through 2001 data from a large U.S. managed care organization.²¹ These published costs were inflated to 2007 values (\$28,990), using the medical care component of the Consumer Price Index.²² Statin costs were measured for MA-PD and PDP members with a claim for a statin between July and September 2007. For each statin user identified, 6 months of claims data were analyzed to measure the median pharmacy ingredient costs over a 6-month period; costs were annualized by multiplying by 2.

Data extraction and statistical analysis were conducted using SAS Version 9.1 (SAS Institute, Inc., Cary, NC). Means were compared by *t*-tests and percentages were compared using Pearson chi-square tests. All comparisons were 2-sided and performed at a 0.05 level of significance.

Results

After excluding members who were not continuously enrolled during the identification and follow-up periods (i.e., from January 1, 2006, through December 18, 2006), the evaluation population consisted of 1,144 intervention members (468 MA-PD and 676 PDP) and 700 MA-PD comparison members (Table 2). Mean (SD) age was 69.5 (12.3) years for the intervention group and 70.7 (12.0) years for the comparison group ($P=0.042$). Geographic distribution was different for the 2 groups, with the majority of the comparison group residing in California compared with the majority of the intervention group residing in states other than Arizona, California, or Texas (e.g., Illinois, Florida, and Colorado). The intervention and comparison groups were similar with respect to gender and CDS.

During the follow-up period, 12.1% of members targeted for the intervention filled a prescription for a statin medication compared with 7.3% of comparison members ($P=0.001$) (Table 2). After adjusting for age, gender, CDS, and geography, the odds of initiating a statin medication were 65% higher (adjusted odds ratio

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TABLE 2 Member Characteristics at Baseline and Pharmacy Claims for Statins in the 4-Month Follow-Up Period^a

	MA-PD Intervention (N = 468)	PDP Intervention (N = 676)	Overall Intervention (N = 1,144)	MA-PD Comparison (N = 700)	P Value ^b
Age, mean (SD)	73.3 (10.0)	66.9 (13.0)	69.5 (12.3)	70.7 (12.0)	0.042
Female gender	262 (56.0%)	475 (70.3%)	737 (64.4%)	469 (67.0%)	0.259
Geographic state					
Arizona	115 (24.6%)	10 (1.5%)	125 (10.9%)	107 (15.3%)	<0.001
California	188 (40.2%)	81 (12.0%)	269 (23.5%)	351 (50.1%)	
Texas	77 (16.5%)	20 (3.0%)	97 (8.5%)	88 (12.6%)	
Other	88 (18.8%)	565 (83.6%)	653 (57.1%)	154 (22.0%)	
Mean [SD] Chronic Disease Score ^c	7.6 [2.8]	7.1 [3.0]	7.3 [2.9]	7.2 [2.9]	0.327
Pharmacy claim for a statin during the follow-up period	58 (12.4%)	80 (11.8%)	138 (12.1%)	51 (7.3%)	0.001

Values are shown as number (%) unless noted otherwise.

^a The database does not identify Medicare versus Medicaid dual-eligible beneficiaries.

^b Represents the level of significance between intervention and comparison group members, using Pearson chi-square tests for proportions and t-tests for means.

^c Chronic Disease Score was calculated during the identification period using the methodology described by VonKorff et al.²⁰

MA-PD=Medicare Advantage Prescription Drug; PDP=prescription drug plan.

[OR]=1.65; 95% confidence interval [CI]=1.15-2.36; P=0.006) for the intervention group than for the comparison group (Figure 2). The variables of age, gender, CDS, and geography did not significantly predict members who were likely to start a statin.

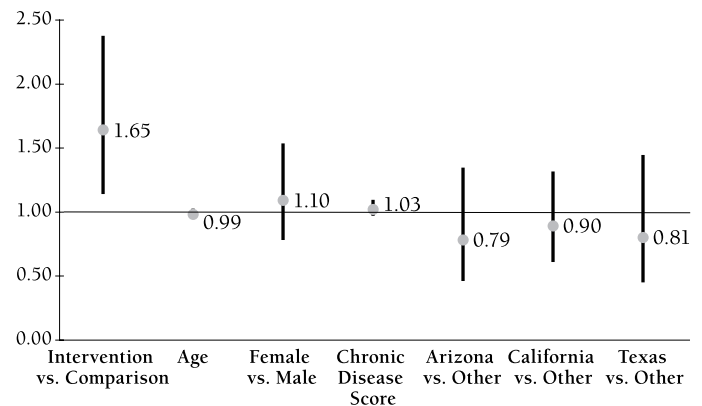
Analysis of the number of interventions needed to prevent 1 cardiac event showed that prescribers for 20 members would need to be contacted to result in 1 statin initiation, and an estimated 11 members would need to be treated with a statin medication for a median of 5.4 years in order to avoid 1 major coronary event (Table 3). As a result, it would be necessary to conduct the intervention with prescribers of 220 members to avoid 1 major coronary event.

After subtracting the costs for statin medication and program administration from the major coronary event costs, the costs avoided by conducting the intervention in 220 members (enough members to avoid a major coronary event) were estimated to be \$12,323. Thus, costs avoided by preventing 6 major coronary events among 1,340 members would total more than \$73,000 (Table 4).

Discussion

A statin intervention aimed at prescribers of MTMP members with diabetes or CAD was successful in increasing statin medication use among members at higher risk for CV events. After controlling for age, gender, level of comorbidity, and the geographic state where the member resides, members who received the intervention were 65% more likely to start a statin medication than members who did not receive the intervention. Analysis of estimated coronary event costs associated with the intervention indicated that there is potential for cost savings associated with

FIGURE 2 Odds of Starting a Statin During the Follow-Up Period, Logistic Regression Analysis, Odds Ratio, and 95% Confidence Limits



The "other" category includes members across the other 50 states, with the greatest proportion of these members residing in Illinois, Florida, and Colorado. C-statistic=0.581.

the intervention and should alleviate concerns that the intervention may increase health care spend.

These results are consistent with the findings of a randomized controlled trial conducted by Lester et al., which demonstrated

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TABLE 3 Estimate of the Number of Members Needed to Intervene and Treat to Avoid One Major Coronary Event

Measure	Formula	Calculation	Result
(A) Number of interventions needed to produce 1 statin initiation	$\frac{1}{\text{(rate of starting a statin in intervention group—rate of starting a statin in comparison group)}}$	$\frac{1}{(0.12 - 0.07)}$	20
(B) Number needed to treat with statins to avoid 1 major coronary event ^a	$\frac{1}{\text{(event rate in placebo group—event rate in statin group)}}$	$\frac{1}{(0.28 - 0.19)^b}$	11
Number of interventions needed to avoid 1 major coronary event	(A) times (B)	20 × 11	220

^aMajor coronary events include coronary death, nonfatal definite or probable MI, silent MI, or resuscitated cardiac arrest as defined in reference 3.

^bEvent rates were obtained from reference 3. Numbers represent the rates of having a major coronary event over median 5.4-year follow-up period. MI = myocardial infarction.

TABLE 4 Estimate of Costs Avoided Over a 5.4-Year Period by Conducting the Intervention in Enough Members to Avoid One Major Coronary Event^a

Costs	Formula	Calculation	Result
Costs of a major coronary event	–	–	\$28,990 ^b
Statin cost to prevent 1 major coronary event	Number needed to treat to avoid a major coronary event × annual statin drug cost × 5.4 years	11 × \$275 ^c × 5.4	\$16,335
Program cost	220 interventions × cost per intervention (printing, postage, and personnel time)	220 × \$1.51	\$332
Total cost to prevent 1 major coronary event	Statin costs for 11 members + program cost for 220 interventions	\$16,335 + \$332	\$16,667
Costs avoided by conducting the intervention	Costs of 1 major coronary event—total cost to prevent 1 major coronary event (220 interventions leading to 11 members treated with a statin)	\$28,990 - \$16,667	\$12,323

^aCalculations based on an intervention conducted in 220 members (the number needed to intervene to treat enough members to avoid 1 major coronary event, defined as coronary death, nonfatal definite or probable MI, silent MI, or resuscitated cardiac arrest).

^bCosts of a major coronary event were obtained from reference 21 and represent the first-year costs following an acute myocardial infarction or intermediate coronary syndrome using 1999 through 2001 data from a large U.S. managed care organization. Published costs were inflated to 2007 values using the medical care component of the Consumer Price Index.

^cStatin costs were measured for MA-PD and PDP members with a claim for a statin between July and September 2007. For each statin user identified, 6 months of claims data were analyzed to measure the median pharmacy ingredient costs over a 6-month period; costs were annualized by multiplying by 2.

MA-PD = Medicare Advantage Prescription Drug; MI = myocardial infarction; PBM = pharmacy benefit manager; PDP = Prescription Drug Program.

a positive change in statin medication prescribing following a prescriber-targeted intervention. Educational messaging delivered via rapid response e-mails to 14 primary care providers caring for 235 patients resulted in both an increase in adherence to NCEP guidelines (statin prescription change rates were 15% for intervention patients vs. 2% for controls at 1 month, $P=0.001$; median months until statin prescription change was 0 vs. 7.1, respectively, $P=0.005$) and a decrease in LDL-C in patients with elevated cholesterol levels (post-intervention levels of 119.0 mg per dL for intervention patients vs. 138.0 mg per dL for controls, $P=0.04$).¹⁹ Although the intervention leveraged electronic tech-

nologies to facilitate message dissemination and order entry and fulfillment, it is reasonable to assume that mail-based programs would be similarly effective at modifying prescriber behavior and increasing appropriate utilization of statins.

In contrast, interventions with members to increase the appropriate use of statin medications have not been so successful. A nurse-managed disease management program that provided telephone and mail communications with members did not demonstrate an improvement in statin medication utilization during the first year after an MI.²³ The proportion of members who used a statin during the first year post-MI was the same for

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intervention and controls (83%), and statin medication adherence was not statistically different between the 2 groups (medication possession ratio 73% vs. 78%, respectively, $P=0.065$). Because changes to medication therapy require a prescription from a health care provider, it is not surprising that interventions with prescribers would have better success with improving medication use than interventions with members. With the mandates from the Centers for Medicare & Medicaid Services that Medicare Part D sponsors provide MTMPs to high-cost members with multiple chronic diseases and multiple medications,²⁴ further research is necessary to examine best methods for improving medication use in these members. If less intensive and less costly targeted interventions focusing on prescribers can have an equal or greater impact on improving medication use outcomes for members as high-touch member interventions, such interventions are worth examining and implementing in large populations.

Limitations

Finding a similar comparison group creates challenges. For example, it is not acceptable for a health plan to withhold the intervention from MTMP members who are identified as needing treatment with a statin medication. Therefore, a comparison group had to be selected from outside the MTMP population. While differences in the identification criteria for the intervention and comparison groups were minimized as much as possible, it is possible that members selected for the comparison group had different clinical characteristics that may have influenced the rate of starting a statin medication.

Second, the comparison group differed from the intervention group in several potentially important ways. The comparison group only contained MA-PD members, while the intervention group consisted of MA-PD and PDP members. Medical claims were not available for PDP members. Accordingly, among PDP members who were potentially eligible for MTMP, the identification of the presence of certain specific diseases required the use of member-reported data, which were not solicited among MA-PD members. Nonetheless, there is no reason to suspect that health plan type (PDP and MA-PD) would influence the likelihood of starting a statin medication; the percentage of intervention members who filled a prescription for a statin medication during the follow-up period was similar for MA-PD and PDP members (12.4% vs. 11.8%).

In addition to the fact that the comparison group members were in MA-PD plans only, the comparison members did not have to meet the requirement of at least 3 of the following chronic diseases: hypertension, hyperlipidemia, CAD, congestive heart failure, and diabetes. Thus, the comparison group was left with relatively fewer members with CAD and more members with diabetes than the intervention group. Distributions of diabetes and CAD for the intervention group and comparison group were as follows: diabetes and no CAD was present in 52% of the intervention group and 93% of the comparison group, CAD and no

diabetes was present in 18% of the intervention group and 5% of the comparison group, and diabetes plus CAD was present in 30% of the intervention group and 2% of the comparison group. Even though it might be argued that the lower rate of initiating statin therapy in the comparison group was the result of the comparison group consisting of a greater proportion of members with diabetes, a post-hoc analysis of the subgroup of members with diabetes and no CAD found that this was not the case, with the initiation rate of statin therapy higher for the intervention group (60 of 592 members initiated a statin, 10.1%) than the comparison group (44 of 653 members initiated a statin, 6.7%; $P=0.031$). Additionally, even though the intervention group was required to have more stringent requirements on the presence of specific comorbid conditions, the level of comorbidity was not significantly different for the overall intervention patients than the comparison patients (CDS 7.3 vs. 7.2, respectively).

Third, while this intervention can easily be conducted in populations where a health plan or PBM has both pharmacy and medical claims, the intervention is more difficult to implement where only pharmacy claims are available. We collected member-reported data to help identify which PDP patients may be eligible for this intervention, but member-reported data may be difficult to collect and may not always be reliable. Using drug proxies for identifying diseases through pharmacy claims is feasible but may not be accurate in identifying certain conditions. For example, the sensitivity and specificity of using pharmacy claims to identify members with diabetes may be higher than the sensitivity and specificity of using pharmacy claims to identify members with CAD. In addition, it is not possible to identify from claims data all of the members with a contraindication to a statin (e.g., liver disease, myopathy).

Fourth, a 4-month period following the intervention was used to evaluate response to the intervention. In some cases, this follow-up period may have been too short to evaluate the impact of the program because members may only visit their physician every 6 months or longer. However, if a longer follow-up period was used to evaluate the intervention, there may have been influences other than the intervention program that led a member to start a statin.

Fifth, we did not measure actual costs other than statin drug cost and administrative cost for the mailing to prescribers. Actual health plan costs for a major coronary event may be higher or lower than our estimate. We also did not assess actual physician visit costs, including any laboratory or other monitoring costs, that might be precipitated by the addition of statin drug therapy. Actual median statin drug cost of \$22.92 per month suggests a large proportion of patients received generic statins, and actual drug costs will be higher or lower for other health plans depending on the generic dispensing ratio for statins.

Finally, we did not have access to data that would permit reporting of the proportion of Medicare-Medicaid dual-eligible beneficiaries in the present study.

Effect of an Intervention to Increase Statin Use in Medicare Members Who Qualified for a Medication Therapy Management Program

Conclusion

This analysis shows that an intervention with prescribers of high-risk, high-cost Medicare Part D members can increase the use of a statin medication. This intervention with prescribers will increase pharmacy costs for statin drugs with the expectation that major CV events will be avoided as a result of increased use of statin drugs in this high-risk population of Medicare MTMP members with diabetes or CAD.

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DISCLOSURES

There was no external funding for this study, and the authors report no conflict of interest associated with this study. Tjioe, Lew, Stroup, and Harada contributed to the design of the clinical program; Stockl and Harada contributed to the design of the program evaluation. Gong, with assistance from Stroup, collected the data associated with the intervention. Data analysis was performed primarily by Gong, and data interpretation was performed by Gong, Stockl, and Harada. Stockl wrote the manuscript with assistance from Tjioe. All authors contributed to the revision of the manuscript.

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