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Prescription Drug Benefits and Use of Guideline Recommended Medications by Elderly Medicare Beneficiaries with Diabetes Mellitus

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Abstract

Objectives—To determine whether prescription drug benefits are associated with the use of guideline recommended medications by older persons with type 2 diabetes mellitus.

Design—Cross-sectional study

Participants—A national sample of Medicare beneficiaries with diabetes aged ≥ 65 years and an indication for angiotensin-converting enzyme (ACE) inhibitor or angiotensin II-receptor blocker (ARB) use or increased risk of coronary heart disease (hypertension or current smoking) who participated in the 2003 Medicare Current Beneficiary Survey.

Measurements—Prescription drug coverage was measured by self-report and verified by insurance claims. Outcome variables were only ACE/ARB or statin use, or combined ACE/ARB and statin use. Survey weighted multinomial logistic regression was used to identify the independent effect of drug coverage on one of two categories of recommended medication use (only ACE/ARB or statin, or combined ACE/ARB and statin) compared to the reference category of none after controlling for sociodemographics and health status.

Results—The final study sample was 1,181 (weighted N = 4.0 million). Overall, 23% had no drug coverage, 16% Medicaid coverage, 43% employer coverage, 9% Medigap coverage, and 9% Veterans' Affairs (VA) or state-sponsored low-income coverage. Overall, 33% received both statins and ACE/ARBs, 44% only an ACE/ARB or statin, and 23% neither. After adjustment, VA and state-sponsored drug benefits were most strongly associated with combined ACE/ARB and statin use [RRR 4.83 (95% CI 2.24-10.4)], followed by employer-sponsored coverage [RRR 2.60 (95% CI 1.67-4.03)].

Conclusions—Prescription drug benefits from VA and state-sponsored drug programs are strongly associated with use of recommended medications by older adults with DM.

Keywords

Diabetes mellitus; drug utilization; insurance; Medicare; health care quality

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INTRODUCTION

Type 2 diabetes mellitus (DM) is a common and increasingly prevalent chronic condition among older adults for which multiple pharmacotherapies reduce morbidity and mortality.1 Aspirin and statins (HMG-CoA reductase inhibitors) protect against cardiovascular disease (CVD).2 Angiotensin-converting enzyme (ACE) inhibitors and angiotensin II-receptor blocking agents (ARB) forestall progression of diabetic nephropathy1 and improve cardiovascular outcomes for DM patients with and without hypertension.3 Clinical practice guidelines recommend multimodal drug therapy for DM. Specifically, National Cholesterol Education Program (NCEP) III guidelines from 2001 deemed DM a coronary heart disease (CHD) risk equivalent, effectively recommending statin treatment for most elders with DM. 2 Further, the American Diabetes Association (ADA) recommends that patients with diabetes and hypertension receive either an ACE inhibitor or an ARB, and suggests considering an ACE/ARB in patients without hypertension.1 Despite these guidelines, underuse of ACE/ARBs 4 and statins 5 is reported among older adults with DM. Income-related differences6 and ageism 5 partially explain underuse of guideline-based therapies. Among older adults with CVD, lack of prescription drug coverage also contributes to medication underuse.7

In 2003, the US Congress passed the Medicare Modernization Act (MMA) and provided prescription drug benefits to Medicare beneficiaries who otherwise lacked drug benefits. After MMA implementation in 2006, the proportion of beneficiaries lacking drug benefits dropped from 25% to 10%8, effectively reducing economic barriers to drug acquisition for those without drug coverage. In 2008, 57% of Medicare's 44 million beneficiaries received drug coverage from a Part D plan (11.2 million Medicare fee-for-service enrollees, 6.2 million low-income and Medicaid enrollees, and 8 million Medicare managed care enrollees) and the rest continued coverage from an employer-sponsored retirement plan (23%) or from the Veterans Affairs' (VA) system or state pharmacy assistance programs (9%).9 After the implementation of Part D, cost-sharing still varied depending on enrollment into Part D, eligibility for low-income subsidies and Part D plan choice.10 In general, Part D enrollees qualifying for low-income subsidies (including Medicaid enrollees) paid less (e.g. $3.10-$5.35 for brand drugs) then higher income enrollees (e.g. $29 for brand drugs in Wellpoint basic plan and $57 for brand drugs in Wellcare's Signature Part D plan) in 2007.10 VA enrollees typically paid $8 for brand or generic drugs11, and Medicare beneficiaries with employer-sponsored drug plans paid less (e.g. $43, on average, for non-preferred brand drugs) than Part D enrollees ($63 for non-preferred brand drugs).10 It is therefore still important to understand how differences in drug coverage might affect quality of care and use of recommended drug therapies for chronic diseases such as DM.

In order to understand the effect of drug coverage on pharmacologic treatment for DM, we conducted this study to examine the relationship between drug benefits and use of recommended therapies for DM. Specifically, since the combined use of both statins and ACE/ARB is more expensive than the use of either alone, we hypothesized that beneficiaries with the most generous drug benefits (i.e. VA and Medicaid) would be most likely to use both therapies compared to beneficiaries without drug benefits after controlling for potential confounders.

METHODS

Data source

The Medicare Current Beneficiary Survey (MCBS) from 2003 was the data source for this study. The MCBS is a continuous face-to-face panel survey of a representative national

sample of approximately 16,000 Medicare beneficiaries conducted by the Centers for Medicare and Medicaid Services (CMS) since 1991. Measures include demographics, income, health status, functioning, health behaviors, health insurance coverage, health care utilization and expenditures, and access to medical care.12

The MCBS sample is drawn from CMS's enrollment data for all Medicare beneficiaries according to a multi-stage sampling plan. Geographic primary sample units (PSUs, n=107) consist of groups of counties that are representative of the nation as a whole and zip codes within them. Systematic random samples are selected within age strata in each sampled zip code, with oversampling of vulnerable subgroups such as younger disabled beneficiaries and the oldest-old (≥ 85 years old).12

Respondents are interviewed in person thrice yearly using Computer Assisted Personal Interviewing (CAPI), resulting in very high response rates (initially about 85%). The typical MCBS interview lasts approximately one hour. Prescription drug acquisition data are based on self-reports. To assure accurate recall, respondents are asked to keep medication logs, save insurance receipts, and show the interviewers all of their medication containers.13 The MCBS does not capture use of over-the-counter (OTC) medications, including aspirin. The full interview cycle is completed over four years.12

Study population

The study population was drawn from the 14,916 non-institutionalized Medicare beneficiaries participating in the fall 2003 MCBS.14 Patients were eligible for study if they had a physician or hospital encounter with a diagnosis of diabetes mellitus (International Classification of Diseases, Ninth Revision, code 250.xx) between January 1, 2003 and December 31, 2003. Patients were excluded from analysis if they had a history of liver disease recorded in their Medicare claims, or end-stage renal disease (ESRD) identified as the basis of eligibility for Medicare. We excluded beneficiaries in Medicare managed care organizations since Medicare claims (necessary to identify comorbidities and specialist visits) are not available for this group.

To create a single at-risk group eligible for both ACE/ARB and statin use consistent with 2003 clinical guidelines15, we limited our sample to adults aged ≥ 65 years with DM, an indication for angiotensin-converting enzyme (ACE) inhibitor or angiotensin II receptor blocker (ARB) use, and increased risk of CHD (history of hypertension or current smoking).2،15 The presence of a renal indication for ACE-inhibitor or ARB use was determined by the presence of at least 2 claims containing a diagnosis of diabetic nephropathy, proteinuria, glomerulonephritis, or nephrotic syndrome. Patients were identified with hypertension if there were at least 2 claims with that diagnosis. Current smoking was identified by self-report. The final sample consisted of 1,181 beneficiaries (weighted N = 4.0 million).

Measures

The outcome of interest was any use of an ACE inhibitor or ARB, statins, or both in 2003. Aspirin was not measured in MCBS and is therefore not included in our analysis. Among comorbid conditions identified from claims, we included diagnoses for concordant conditions (conditions representing parts of the same overall pathophysiologic risk profile as DM)16 that might positively affect the receipt of outcome drugs (myocardial infarction or coronary artery disease, congestive heart failure [CHF], peripheral vascular disease [PVD], cerebrovascular disease) and selected discordant (not directly related in either pathogenesis or treatment)16 conditions or conditions conferring limited life expectancy that might decrease the use of ACE/ARB or statins (chronic obstructive pulmonary disease [COPD],

any cancer and dementia).1 We searched all physician visits to define visits to a cardiologist or endocrinologist.

The MCBS survey measures annual household income in increments of $5,000. We report income in the following categories (< $10,000; $10,001-$20,000; $20,001-$40,000). The two lowest income categories roughly correspond to the 100% and 200% federal poverty thresholds, respectively.17 We also report the following variables: self-reported race (black, white, Hispanic, other), education level (no high school, high school, above high school), and rural/metropolitan residence.

Drug coverage is ascertained by response to the question “Does your (supplemental insurance) provide drug coverage?” Since many individuals are uncertain about the services covered by their health insurance, this response is compared to any claims or bills for prescription drugs. For example, if a respondent answers “no” to having drug coverage, but provides a claim stating insurance payment for a drug, then the response is changed to “yes” for drug coverage in the MCBS files. We defined the following levels of drug coverage: no drug coverage, Medicaid, employer-sponsored, Medigap (self-purchased Medicare supplement with drug coverage), and VA or other public coverage (e.g. a state-sponsored low-income plan).

Statistical analysis

We describe the demographic and health characteristics of the study population and determine the prevalence of prescription drug insurance by demographics, socioeconomic status, and health variables. To provide national estimates, we used the sample weights included in the MCBS file and the Taylor expansion method for weighting and variance calculation recommended by the MCBS Technical Documentation.14 We used Pearson χ^2 statistic corrected for survey design to assess the statistical significance of bivarariate associations18 and weighted multinomial logistic regression to identify the independent effect of drug coverage on one of two categories of recommended medication use (only ACE/ARB or statin, or both ACE/ARB and statins) compared to the reference category of none after controlling for sociodemographic characteristics and health status.19 Multinomial logistic regression was appropriate since the outcome variable had 3 categories but did not satisfy the proportional hazards assumption required for ordinal regression.20 No factors in the final model had a correlation coefficient of greater than 0.40.

All analyses were conducted in Stata v10.0. (Stata Corporation, College Station, TX) This study was approved by the IRB of the University of Massachusetts Medical School.

RESULTS

The final study cohort included 1,181 Medicare beneficiaries (weighted N=4 million). Overall, 23% had no drug benefits, 16% Medicaid drug benefits, 43% employer coverage, 9% Medigap coverage, and 9% VA or other public coverage. Multiple sociodemographic characteristics differed by type of coverage, including sex, race/ethnicity, annual income, educational attainment, and rural residence. (Table 1) Employer-sponsored coverage was more prevalent among men (54%), whites (48%), those with an income of $20,000-$40,000 (63%), education above high school (54%) and metropolitan residence (44%). Nearly one-third of the near-poor (annual income $10,001-$20,000) and rural residents had no drug benefits. Ninety-eight percent (98%) of the study sample had a history of hypertension. Twenty-five percent (25%) of beneficiaries had a history of MI or CAD, 22% a history of cerebrovascular disease, 5% CHF, and 5% a renal indication for an ACE/ARB. Of the chronic conditions examined, only a history of cerebrovascular disease was significantly associated with having drug coverage (p=0.001).

Table 2 shows unadjusted associations between patient characteristics and use of recommended medications in DM. Overall, 33% received both ACE/ARB and statins, 44% only an ACE/ARB or statin, and 23% neither recommended therapy. The group receiving ACE/ARB and statins had a greater proportion of adults aged 65-74 yrs (35%) and beneficiaries with a history MI/CAD (41%), PVD (41%), cerebrovascular disease (39%), renal indication for ACE/ARB (48%), or specialty care from an endocrinologist (49%). Having any type of drug coverage appeared to be associated with a higher prevalence of receiving both an ACE/ARB and statins (Medicaid: 39%; employer-sponsored: 38%; Medigap: 26%; VA or other public: 37%) compared to having no drug coverage (20%). Overall, beneficiaries without drug coverage received no recommended therapy more often (31%) than beneficiaries with some type of coverage (13-24%). (Table 2) Other variables associated with lower use of combined ACE/ARB and statin therapy included age ≥ 85 (21%) and rural residence (26%).

In the multinomial logistic regression, the association between some types of drug benefits and use of combined ACE/ARB and statin therapy persisted after adjustment. (Table 3) Specifically, those with VA or other public coverage and those with employer benefits had a significantly higher likelihood of receiving combined ACE/ARB and statin therapy [RRR 4.83 (95% CI 2.24-10.4), RRR 2.60 (95% CI 1.67-4.03), respectively]. VA and other public drug coverage was also significantly associated with a higher likelihood of partial therapy with only an ACE/ARB or statin [RRR 2.67 (95% CI 1.35-5.28)]. Employer-sponsored coverage was also significantly associated with combined ACE/ARB statin use [RRR 2.60 (95% CI 1.67-4.03)]. There was no statistically significant association between Medicaid or Medigap with use of recommended therapies.

After adjustment, non-economic factors that remained significantly associated with combined statin and ACE/ARB use included history of MI or CAD [RRR 1.75 (95% CI, 1.14-2.70)] and having visits to a cardiologist or endocrinologist [RRR 1.48 (95% CI, 1.01-2.17), RRR 2.39 (95% CI, 1.18-4.85), respectively]. Older age (≥ 85 years vs 65-74 years) [RRR 0.44 (95% CI, 0.26-0.77)] and having COPD [RRR 0.29 (95% CI: 0.09-0.88)] were negatively associated with combined ACE/ARB and statin use. Higher annual income was not associated with recommended therapy use. No differences were observed by sex or race. (data not shown)

DISCUSSION

Clinical practice guidelines recommend the use of statins and ACE inhibitors or ARBs for most elders with DM. Despite the dissemination of these guidelines before the first year of the present investigation, we found that only one-third of high-risk older adults with DM received both statins and an ACE/ARB by 2003. We also demonstrate that the use of recommended therapies was strongly associated with possession of VA, state-sponsored and employer-sponsored drug benefits, but not generous coverage from Medicaid. Our findings are similar to results showing greater statin use among older adults with CVD and drug benefits in a 1997 sample of Medicare beneficiaries.7 We believe our findings suggest that a combination of drug benefit generosity and other factors contribute to the use of guideline recommended medications.

We expected to find that having the most generous types of drug coverage (i.e. Medicaid and VA) would be associated with a higher likelihood of the combined use of both statins and ACE/ARB compared to having no drug coverage. Instead, we observed variation in the strength of the association between drug benefits and recommended drug use among drug plans, with the VA having the strongest association followed by employer-sponsored plans. This may be explained by taking a closer look at the VA system. A recent study comparing

diabetes care quality between VA and commercial managed care found that diabetes process of care was better for VA patients.21 This difference is attributed to well-described reengineering efforts in the VA system to improve the efficiency and effectiveness of clinical services through care integration, promotion of practice guidelines, performance monitoring, payment incentives and information technology.21 These authors suggest that similar outcomes may be achieved in other healthcare plans by implementing similar changes.

Disease management programs are similarly motivated efforts to improve chronic disease management using coordinated and proactive efforts to enhance and support patient care.22 Our finding that employer-sponsored drug benefits were also associated with use of combined ACE/ARB and statin use may be explained by the use of disease management programs in many employer health insurance plans. By 2005, over half of employer health plans offered at least one disease management program, many of them for diabetes.22 The difference in the strength of the association between VA or other public benefits and combined use of ACE/ARB and statins (RRR 4.83) compared to employer-sponsored benefits (RRR 2.60) might be explained by systematic differences in care-delivery structure (e.g. the extent of information technology integration) offered by the two groups. This is outside the scope of our investigation, but deserves further study.

Although Medicaid offers generous drug benefits, we failed to observe a statistically significant association with combined ACE/ARB and statin use. The interpretation of this finding is not straightforward, but may, in part, be explained by our exclusion managed care enrollees, including Medicaid managed care patients. Although over 30 states offered disease management in their Medicaid program by 2004,23 these were usually limited to enrollees of Medicaid managed care organizations. The exclusion of the managed care population from our study may have affected our findings. Additionally, other studies report underuse of effective medications among Medicaid enrollees and this may also be a factor in our study.7, 24

Previous studies have shown a significant relationship between lower annual income and underuse of recommended DM drug therapy among a Medicare managed care population who had the same pharmacy benefit.6 Our study did not demonstrate a relationship between income and drug therapy, but this may be explained by the strong relationship between income and possession of drug benefits. We also found that patients who received subspecialty care were more likely to receive combined ACE/ARB and statin treatment, and this finding is consistent with other studies.25 26

We acknowledge that despite the publication of NCEP III guidelines expanding indications for statins to many older adults with DM in 20012, delays in the dissemination and uptake of clinical guidelines also contribute to the low prevalence of recommended medication use in other studies27 and was likely a factor in our study. However, our findings of low use of combined statin and ACE/ARB therapy among the oldest-old (age ≥ 85 years) is consistent with other studies demonstrating lower statin and ACE/ARB use among high-risk older adults.4, 5 Other unmeasured, non-economic, confounders may also explain the underuse of recommended therapies, such as patient preference and adherence behavior, and physician's usual practice, all factors described in a survey of qualitative and quantitative factors influencing hypoglycemic choice in DM management.28

The limitations of this study deserve comment. First, medication use was based on self-report and did not include aspirin use. Previous MCBS reports suggest underreporting is on the order of 5% of filled prescriptions.13 However, because measures were based on actual medication containers and receipts, and not only self-report or claims, this measurement bias

is non-differential by drug coverage thereby minimizing bias of our results. Second, it is possible that beneficiaries with drug benefits were sicker and had greater need for pharmacotherapy than those without benefits. To account for this, we risk adjusted by including the presence of chronic conditions in our study that contribute to greater medication use and health service use. Further, by including receipt of subspecialist care in our analysis, we adjusted for other potential unmeasured severity of illness confounders since patients with DM who receive subspecialty care usually have more severe disease and poorer glycemic control.29 Previous studies examining adverse selection in prescription drug benefits demonstrate that risk adjustment reduces bias caused by insurance selection on drug utilization.30 We also excluded managed care enrollees from our study population, limiting the generalizability of our findings to this population, including Medicaid managed care enrollees. Finally, we were unable to determine whether medications were not received because of a previous history of adverse drug reaction to the medication (e.g. cough in ACE inhibitor), patient preference or physician assessment of limited benefit due to limited life-expectancy.

We conclude that prescription drug benefits from VA and state-sponsored drug programs and from employer-sponsored plans are associated with the use of recommended DM therapy for older adults. Moreover, the VA's drug benefit is most strongly associated with combined ACE/ARB and statin use in their management of type 2 diabetes. We believe this suggests that the VA system, with generous drug benefits combined with strong disease management and information technology integration, contributes to better quality of medication use in DM. This also suggests that generosity of drug coverage alone is insufficient to promote quality of medication management for type 2 DM. The implication for Medicare beneficiaries in the post-Part D era is that the gains in access made by expanding drug coverage may not be realized without coordinated promotion of clinical practice guidelines or disease management programs.

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Table 1

Patient Characteristics, by Type of Prescription Drug Coverage

Patient Characteristic	Full Sample (Unweighted N=1 181)	Prescription Drug Coverage (Weighted %)					
		None n= 275 (23%)	Medicaid n= 193 (16%)	Employer n= 503 (43%)	Medigap n= 107 (9%)	VA & Other Public n=103 (9%)	p*
Age (y)							
65-74	501	23.8	16.5	43.9	7.6	8.2	0.34
75-84	508	21.7	15.1	44.2	8.70	10.4	
≥ 85	172	24.4	17.6	36.2	13.9	7.9	
Sex							
Male	502	21.5	8.1	54.0	7.3	9.1	<0.001
Female	679	24.0	21.5	35.7	9.7	9.0	
Race/Ethnicity							
White	954	24.2	9.3	48.1	9.7	8.7	<0.001
Black	163	20.4	34.8	26.8	6.4	11.6	
Hispanic	35	10.7	65.7	14.3	0.0	9.3	
Other†	29	12.3	65.1	15.3	2.7	4.6	
Income							
<$10,000	284	18.4	56.3	12.2	5.0	8.2	<0.001
$10,001-$20,000	389	31.4	8.4	36.5	5.1	15.7	
$20,001-$40,000	356	19.5	0.9	63.2	11.6	4.9	
>$40,000	152	18.8	0.0	66.7	10.3	4.2	
Education‡							
No High School	227	27.0	38.2	17.6	6.6	10.7	<0.001
High School	243	22.3	22.6	34.1	8.5	12.5	
Above High School	705	22.1	7.3	53.7	9.4	7.4	
Metropolitan Residence							
Rural	363	30.7	12.7	40.8	7.9	7.8	<0.01
Metro	818	20.2	17.2	44.1	9.1	9.5	
Comorbid Conditions							
MI or CAD	301	22.7	16.3	44.2	7.1	9.6	0.83
CHF	56	31.7	11.8	37.6	7.7	11.1	0.54

Patient Characteristic	Full Sample (Unweighted N=1 181)	Prescription Drug Coverage (Weighted %)					
		None n= 275 (23%)	Medicaid n= 193 (16%)	Employer n= 503 (43%)	Medigap n= 107 (9%)	VA & Other Public n=103 (9%)	p*
PVD	24	17.2	18.5	34.1	11.8	18.3	0.54
Cerebrovascular disease	258	17.7	24.6	40.2	9.2	8.4	0.001
COPD	33	26.5	12.0	31.6	14.8	15.1	0.39
Dementia	55	23.0	20.1	37.3	7.7	11.9	0.82
Any Cancer	185	20.9	11.3	47.1	9.9	10.8	0.33
Hypertension	1154	22.5	16.2	43.4	8.8	9.1	0.15
Renal disease§	61	13.2	26.3	45.3	5.5	9.7	0.11
Smoking							
None	1068	22.2	15.9	43.9	8.8	9.2	0.51
Current	113	29.8	17.1	37.2	7.9	8.0	
Specialist Care							
Cardiologist visit	630	22.0	16.4	44.1	8.1	9.4	0.87
Endocrinologist visit	90	13.4	15.8	51.0	7.5	12.3	0.28

Abbreviations: MI, myocardial infarction; CAD, coronary artery disease; CHF, congestive heart failure; PVD, peripheral vascular disease; COPD, chronic obstructive pulmonary disease.

For all tables, numbers of beneficiaries (N = 1 181) represent the actual sample sizes in the Medicare Current Beneficiary Survey (MCBS) who meet inclusion criteria; however, all analyses received provided MCBS sampling weights and the Taylor series linearization technique to obtain estimates and standard error.

*Statistical significance by Pearson χ^2 statistic.

†Other includes other, American Indian/Alaskan Native, and Asian.

‡Missing values for 6 respondents.

§Defined as physician or inpatient claim for diabetic nephropathy, proteinuria, or glomerulonephritis.

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Table 2

Use of Recommended Therapies for DM, by Patient Characteristics

	Type of Recommended Therapy for DM (weighted %)			p*
Patient Characteristic	**None n=277 (23%)**	**Only ACE/ARB or Statin n=523 (44%)**	**Both ACE/ARB & Statin n=381 (23%)**	
Age (y)				
65-74	20.8	43.8	35.4	0.02
75-84	24.0	42.7	33.2	
≥ 85	28.3	51.0	20.7	
Sex				
Male	24.0	43.3	32.7	0.79
Female	22.3	44.7	33.0	
Race/Ethnicity				
White	23.8	43.7	32.5	0.90
Black	19.1	45.9	35.0	
Hispanic	20.1	49.0	30.9	
Other	20.7	45.0	34.3	
Income				
<$10,000	21.6	44.9	33.5	0.09
$10,001-$20,000	26.6	46.1	27.3	
$20,001-$40,000	19.4	44.6	36.0	
>$40,000	24.5	37.3	38.2	
Education				
No High School	26.2	38.3	35.4	0.36
High School	22.9	47.5	29.7	
Above High School	22.1	44.9	33.1	
Metropolitan Residence				
Rural	24.5	49.5	26.0	0.01
Metro	22.4	42.2	35.4	
Comorbid Conditions				
MI or CAD	18.5	40.5	41.0	0.004
CHF	20.1	57.2	22.7	0.17
PVD	25.3	33.8	40.9	0.58
Cerebrovascular disease	22.9	37.7	39.4	0.03
COPD	35.7	47.4	16.9	0.09
Dementia	30.1	41.2	28.7	0.43
Any Cancer	23.3	48.9	27.8	0.28
Hypertension	22.5	44.3	33.2	0.12
Renal disease*	11.8	40.7	47.5	0.03
Smoking				
None	22.0	30.8	33.0	0.38
Current	31.2	37.1	31.7	

	Type of Recommended Therapy for DM (weighted %)			p*
Patient Characteristic	**None n=277 (23%)**	**Only ACE/ARB or Statin n=523 (44%)**	**Both ACE/ARB & Statin n=381 (23%)**	
Specialist Care				
Cardiologist visit	20.3	41.9	37.8	0.002
Endocrinologist visit	12.2	38.4	49.4	0.003
Prescription Drug Coverage				
None	31.2	48.5	20.3	<0.001
Medicaid	23.5	37.2	39.3	
Employer	20.2	42.0	37.8	
Medigap	23.6	50.7	25.8	
VA & Other Public	13.3	49.4	37.3	

Abbreviations: ACE/ARB, ACE inhibitor or angiotensin II receptor blocker; MI, myocardial infarction; CAD, coronary artery disease; CHF, congestive heart failure; PVD, peripheral vascular disease; COPD, chronic obstructive pulmonary disease.

*Statistical significance by Pearson χ^2 statistic.

Table 3

Adjusted* Associations with receiving Recommended DM Therapies Compared to receiving no Recommended DM Therapies

Patient Characteristic	RRR (95% CI)	p
Only ACE/ARB or Statin (n=523)		
Prescription Drug Insurance (vs none)		
Medicaid	0.78 (0.41-1.50)	0.46
Employer	1.35 (0.94-1.94)	0.10
Medigap	1.47 (0.79-2.74)	0.22
VA & Other Public	2.67 (1.35-5.28)	<0.01
ACE/ARB & Statin (n=381)		
Prescription Drug Insurance (vs none)		
Medicaid	1.98 (0.94-4.21)	0.07
Employer	2.60 (1.67-4.03)	<0.001
Medigap	1.61 (0.76-3.42)	0.21
VA & Other Public	4.83 (2.24-10.4)	<0.001

Abbreviations: RRR, Relative Risk Ratio. CI, confidence interval; ACE/ARB, ACE inhibitor or angiotensin II receptor blocker.

*Adjusted for age, sex, race/ethnicity, annual income, education, rural/metropolitan residence, history of MI/CAD, CHF, PVD, CVD, COPD, dementia, any cancer, cardiologist visit, and endocrinologist visit in a multinomial logistic regression with beneficiaries who received neither ACE/ARB nor statins (n=277) as reference group receiving complete case analysis. Data are given as relative risk ratio (95% confidence interval). Numbers in boldface are statistically significant at $P<.05$. See Table 1 footnotes for exclusions and numbers of beneficiaries.