

# Cardiovascular Risk Factor Control Among Veterans With Diabetes

## The Ambulatory Care Quality Improvement Project

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**OBJECTIVE** — To describe the extent to which hyperglycemia, hypertension, and dyslipidemia are currently detected, treated, and controlled in U.S. veterans with diabetes with and without ischemic heart disease (IHD).

**RESEARCH DESIGN AND METHODS** — A cohort of 3,769 veterans who self-reported diabetes and who received all health care from the Veterans Administration (VA) medical centers were selected from subjects enrolled in the Ambulatory Care Quality Improvement Project, a randomized health services intervention at seven VA primary care clinics. IHD was defined by a self-reported history of myocardial ischemia, infarction, or revascularization. Mean values of HbA<sub>1c</sub>, blood pressure, and cholesterol subfractions were collected from computerized laboratory databases. Medication data were collected from computerized pharmacy databases.

**RESULTS** — Mean HbA<sub>1c</sub> and optimal control (HbA<sub>1c</sub> <7%) did not differ for those without and with IHD: 8.1 vs. 8.0%, and 26 vs. 24%, respectively. Veterans with IHD were more likely to have hypertension (73 vs. 64%), to be treated (88 vs. 78%), and to have optimal blood pressure control (19 vs. 10%) compared with veterans without IHD (all *P* values <0.01). Veterans with IHD were more likely to have dyslipidemia (81 vs. 53%), were equally likely to be treated (54 vs. 50%), and were more likely to have optimal LDL levels (30 vs. 16%) compared with veterans without IHD, all *P* values <0.01.

**CONCLUSIONS** — Optimal cardiovascular risk factor control was the exception in this cohort of diabetic veterans attending primary care clinics. More aggressive management of cardiovascular risk factors in veterans with diabetes may be warranted, especially among those without prevalent IHD.

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The increased prevalence of cardiovascular risk factors among people with diabetes accounts for much of their increased burden of cardiovascular

morbidity and mortality (1,2). Many of these risk factors can be safely managed with pharmaceutical and nonpharmaceutical interventions. The most recent posi-

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**Abbreviations:** ACQUIP, Ambulatory Care Quality Improvement Project; ADA, American Diabetes Association; IHD, ischemic heart disease; VA, Veterans Administration.

A table elsewhere in this issue shows conventional and Système International (SI) units and conversion factors for many substances.

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tion statement of the American Diabetes Association (ADA) regarding the management of cardiovascular risk factors in adults with diabetes recommends maintaining tight control of glycemia (HbA<sub>1c</sub> <7.0%), serum lipids (LDL <100 mg/dl, HDL >45 mg/dl, and triglycerides <200 mg/dl), and blood pressure (≤129 mmHg systolic and ≤84 mmHg diastolic) in persons with type 2 diabetes as a means of reducing the potential burden of cardiovascular morbidity and mortality on this population (3–5). The ADA recommends initiating drug treatment in people with diabetes and without cardiovascular disease when LDL levels are ≥130 mg/dl and initiating drug treatment in people with diabetes and cardiovascular disease when LDL levels are ≥100 mg/dl. These recommendations are more aggressive in the treatment of hyperlipidemia in adults with diabetes than those of the Expert Panel of National Cholesterol Education Program (NCEP), which recommends initiating drug treatment when LDL ≥160 mg/dl for those with cardiovascular disease and two positive risk factors (diabetes, advanced age [≥55 years for women; ≥45 years for men], smoking, hypertension, HDL <35 mg/dl, or family history of cardiovascular disease) (6). The ADA blood pressure recommendations mirror those of the Sixth Report of the Joint National Committee for the Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (JNC IV) (7).

It is not known to what extent hyperglycemia, hypertension, and dyslipidemia are currently detected, treated, and controlled in U.S. veterans with diabetes. Using data from an ongoing, randomized clinical trial in veterans receiving primary care at Veterans Administration (VA) medical facilities, we examined the level of cardiovascular risk factor control among diabetic veterans with and without ischemic heart disease (IHD).

## RESEARCH DESIGN AND METHODS

The Ambulatory Care Quality Improvement Project (ACQUIP) is a randomized

health services intervention that is being conducted at seven primary care clinics at VA medical facilities throughout the U.S. (White River Junction, VT; Birmingham, AL; Little Rock, AR; Richmond, VA; San Francisco and West Los Angeles, CA; and Seattle, WA).

Veterans were eligible for the ACQUIP study if they were assigned a primary care provider, had a clinic visit in the year before study enrollment, had a valid mailing address, and were not a VA employee, mentally incompetent, or enrolled in a conflicting study. Of the 82,666 veterans eligible for the study between December 1996 and June 1999, 51,733 (63%) were randomly selected and sent the screening questionnaire. Among these, 31,175 (60%) returned the screening questionnaire. We further restricted eligibility to 28,732 (92%) veterans who completed and returned the screening questionnaire between February 1997 and September 1998. The date that the screening questionnaire was received and processed by the study coordinating center was considered the enrollment date. For this report on cardiovascular risk factor control in diabetic veterans, we restricted the analyses to veterans with self-reported diabetes who reported receiving all their health care from the VA.

### Measurements

Baseline data collection instruments included the Health Check List (screening), Patient Information (demographic), Health Status, and Outpatient Satisfaction questionnaires. Veterans who self-reported diabetes, hypertension, and other common general medicine conditions on the screening questionnaire were sent baseline disease-specific questionnaires, which elicited more information on the condition.

Diabetes was defined by self-report. Veterans who reported on the screening questionnaire that a doctor or a nurse told them they had “diabetes” were considered to have diabetes. IHD was also defined by self-report from the screening questionnaire. If a veteran reported a history of a “coronary artery by-pass operation (CABG) or a balloon angioplasty (PTCA),” or if a doctor or a nurse told them that they had “coronary artery disease,” “heart attack,” or “chest pain due to heart problems (angina),” s/he was considered to have prevalent self-reported IHD. Self-reported coronary artery dis-

ease has been shown to be 97% sensitive and 93% specific at detecting clinically diagnosed IHD in this dataset (8).

Glycosylated hemoglobin, HbA<sub>1c</sub>, blood pressure, cholesterol subfractions, and weight data were collected from computerized laboratory databases (VistA) at each VA medical facility. A mean value for each veteran was calculated from any measures taken in the 365 days before or after the study enrollment date. Less than 5% of the glycemia measures were reported as total glycosylated hemoglobin. These values were converted to HbA<sub>1c</sub> measures using the following formula: HbA<sub>1c</sub> percentage = [(glycosylated hemoglobin percentage · 0.6) + 1.7]. HbA<sub>1c</sub> measures were divided at two cut points according to current ADA guidelines: 7.0%, below which is the therapeutic goal; and 8.0%, above which additional action is suggested (3).

Diabetes symptoms, history, and self-reported glucose control questions were collected on the disease-specific diabetes questionnaire. A veteran was considered as having diabetic symptoms if s/he reported having—sometimes, often, or always in the past 6 months—“unusual thirst or dry mouth,” “weakness of an arm or leg,” “numbness of your feet,” “unexplained sharp pains along one arm or leg,” “light-headedness when standing up quickly,” or “pain in your thigh or calf muscles when walking.” If a veteran reported “often” or “all the time” to the question “how often do you keep your blood glucose (glucose) in normal range (80–150),” s/he was considered as having self-reported glucose control.

Hypertension was defined by self-report from the screening questionnaire and according to the mean values of any systolic and diastolic blood pressure measures taken in the 365 days before or after enrollment. A mean systolic blood pressure  $\geq 140$  mmHg or a mean diastolic blood pressure  $\geq 90$  mmHg were defining criteria for hypertension. Therapeutic control of a systolic blood pressure  $\leq 129$  mmHg and a diastolic blood pressure  $\leq 84$  mmHg reflects the current ADA and JNC IV recommendations for hypertensive people with diabetes (3,7). Compliance with antihypertensive therapy was assessed on the disease-specific hypertension questionnaire where subjects were asked, “In the past 4 weeks, how often did you have trouble remembering to take your blood pressure medication?” Those

subjects who reported “rarely” or “never” were considered compliant.

Optimal LDL levels and treatment initiation levels were defined according to the 1998 ADA position statement on the management of dyslipidemia in adults with diabetes (5). Levels of LDL, HDL, and triglyceride cholesterol were defined as the mean value of lipid subfraction measures taken in the 365 days before or after the enrollment date. Dyslipidemia was defined according to pharmaceutical treatment initiation levels or the use of antilipidemic treatment. Pharmaceutical treatment should be initiated when LDL is  $> 100$  mg/dl for diabetic persons with cardiovascular disease (coronary artery, cerebrovascular, or peripheral vascular disease) and when LDL is  $\geq 130$  mg/dl for diabetic persons without cardiovascular disease. For this study, data were not collected on peripheral vascular disease, so this criterion was omitted from the treatment initiation definition of prevalent cardiovascular disease. Optimal LDL levels were  $\leq 100$  mg/dl for all subjects, with or without cardiovascular disease.

Outpatient prescription pharmacy data were collected from VA pharmacy databases at each of the seven VA medical centers. The VA subsidizes the cost of prescriptions for veterans, and it has been reported that 98% of veterans who receive care from the VA fill prescriptions at VA medical facilities (9,10). A veteran was considered a user of a specific pharmaceutical if a prescription for the drug was filled at the VA pharmacy in the 365 days before or after the study enrollment date. Oral hypoglycemic agents included sulfonylureas, acarbose, and metformin. Since the number of prescriptions for angiotensin II receptor antagonists was small, this category was combined with ACE inhibitors. Vasodilator antihypertensive medications included primarily clonidine, reserpine, and minoxidil. Lipid-lowering statin drugs (HMG-CoA reductase inhibitors) included fluvastatin, lovastatin, pravastatin, and simvastatin.

**RESULTS**— We identified 6,139 study participants who self-reported diabetes on the initial screening questionnaire. We excluded 2,370 (39%) veterans who reported receiving care from a non-VA source. Excluded veterans were more likely to be white, married, better educated, nonsmokers, and older. This exclusion resulted in a study population

**Table 1**—Characteristics of veterans with self-reported diabetes who only use VA medical services, ACQUIP, 1997–1998

	Self-reported IHD*	
	Absent (n = 2,158)	Present (n = 1,611)
Demographic and behavioral		
Age (years)	62	65†
Male (%)	97	99†
White (%)	55	61†
Black (%)	26	19†
Married (%)	52	62†
High school education or more (%)	71	62†
Current smoker (%)	24	21†
Weight (lbs)	207	211
Receive health care from VA for ≥5 years (%)	56	68†
Self-reported health and medical histories		
Self-reported health: good or better (%)	46	27†
Self-reported hypertension (%)	64	73†
Congestive heart failure (%)	3	24†
Stroke (%)	9	22†

\*Self-reported history of angina, coronary artery disease, myocardial infarction, or coronary revascularization procedure; † $P < 0.01$ .

of 3,769 individuals: 2,158 (57%) with no self-reported IHD and 1,611 (43%) with self-reported IHD. Disease-specific questionnaires for diabetes were completed by 56% ( $n = 2,118$ ) of those who self-reported diabetes, and hypertension questionnaires were completed by 57% ( $n = 1,452$ ) of those who self-reported hypertension and diabetes.

Table 1 presents the characteristics of veterans with and without IHD. Veterans with IHD were more likely to be older, male, white, married, receiving VA care for >5 years, and to have a self-reported history of hypertension, congestive heart failure, or stroke. They were also less likely to have a high-school education, to smoke, and to report their health as being good, very good, or excellent. Smoking prevalence was >20% in both groups.

The prevalence of self-reported type 1 diabetes was limited and was similar among veterans with and without IHD (Table 2). Most veterans reported that they had diabetes for ≤10 years, and almost all veterans reported diabetes symptoms, although veterans with IHD were more likely to do so. The classic diabetes symptom of excessive thirst or dry mouth was equally reported by those with and without IHD: 70 vs. 66%, respectively ( $P = 0.11$ ). Symptoms that may be more indicative of diabetes complications (neuropathy and foot numbness; claudication

and calf-pains when walking) were more common in those with IHD than in those without IHD: 84 vs. 72%, respectively ( $P < 0.01$ ). Of veterans who self-reported diabetes, 25% were not receiving antidiabetic treatment ( $n = 970$ ). Use of oral hypoglycemic agents without insulin was

more common in veterans without IHD, and use of insulin, with or without an oral hypoglycemic agent, was more common in those with IHD. Data on HbA<sub>1c</sub> and glycosylated hemoglobin were available for 3,104 (82%) veterans. We found no difference in the level of glycemia or glycemic control between those with and without IHD. Roughly half of the population had poorly controlled glycemia by laboratory (HbA<sub>1c</sub> >8%) and self-report measures, but the agreement between the two measures was poor ( $\kappa = 0.11$ ; 95% CI 0.07–0.16).

Among the 970 veterans not receiving pharmaceutical treatment, 54% were filling antihypertensive or antilipidemic drug prescriptions through the VA, and 60% had data on glycemic levels. The mean HbA<sub>1c</sub> value was 7.6, and 37% of veterans had values >8.0%. This percentage did not differ between those with and without IHD. The prevalence of diabetic symptoms was 93% and did not vary according to whether a veteran was receiving pharmaceutical treatment or whether a veteran had data on glycemic levels.

Self-reported hypertension was more common among veterans with IHD compared with those without IHD (Table 3). Blood pressure data were available for 3,332 (88%) veterans. Mean systolic and diastolic measures were higher in those

**Table 2**—Glucose treatment and control among veterans with self-reported diabetes who only use VA medical services, ACQUIP, 1997–1998

	Self-reported IHD*	
	Absent (n = 2,158)	Present (n = 1,611)
Diabetes history		
Self-reported type 1 diabetes (%)	5	3
Diabetes durations >10 years (%)	36	40§
Any diabetes symptom (%)	91	94§
Pharmaceutical treatment		
No treatment (%)	25	26
OHGA only (%)	50	43
Insulin with or without OHGA (%)	24	31
Glycemic control		
HbA <sub>1c</sub> (%)†	8.1	8.0
Optimal: HbA <sub>1c</sub> <7.0%	26	24
Elevated: HbA <sub>1c</sub> 7.0–8.0%	25	28
Additional action suggested: HbA <sub>1c</sub> >8.0%	49	48
Self-reported glucose control (80–150 mg/dl) (%)‡	51	52

\*Self-reported history of angina, coronary artery disease, myocardial infarction, or coronary revascularization procedure; †HbA<sub>1c</sub> and glycosylated hemoglobin measures were available for 3,104 (82%) veterans (absent: 1,805; present: 1,299) from among the 3,769 who were eligible for the study; ‡disease-specific questionnaires for diabetes were completed by 2,118 (56%) veterans from among the 3,769 who were eligible for the study; § $P < 0.05$ ; || $P < 0.01$ . OHGA, oral hypoglycemic agent.

**Table 3 —Elevated blood pressure treatment and control among veterans with self-reported diabetes who only use VA medical services, ACQUIP, 1997–1998**

	Self-reported IHD	
	Absent (n = 2,158)	Present (n = 1,611)
Self-reported hypertension (%)	64	73
Blood pressure† (n)	1,891	1,441
Systolic (mmHg)	143.5	140.2
Diastolic (mmHg)	78.2	74.2
Hypertension (%)	78	81†
Hypertensive (n)	1,476	1,169
Pharmaceutical treatment (%)	79	88
Treated hypertension (n)	1,171	1,031
Diuretic (%)	32	28
β-Blocker (%)	29	59
ACE inhibitor (%)	70	66§
Calcium antagonist (%)	40	53
α-Blocker (%)	27	28
Other vasodilator (%)	12	14
Mean number of antihypertensive drugs	2.1	2.5
Takes antihypertensive medications all or most of the time (%)‡	89	89
Treated hypertension (n)	906	775
Optimal for diabetes: ≤129 SBP and ≤84 DBP (%)	10	19
High normal: 130–139 SBP or 85–89 DBP (%)	18	21
Hypertension stage I: 140–159 SBP or 90–99 DBP (%)	50	44
Hypertension stage II & III: ≥160 SBP or ≥100 DBP (%)	22	16

\*Self-reported history of angina, coronary artery disease, myocardial infarction, or coronary revascularization procedure; †blood pressure measures were available for 3,332 veterans (88%) from among the 3,769 veterans who were eligible for the study; ‡disease-specific questionnaires for hypertension were completed by 1,452 (57%) veterans from among the 2,553 hypertensive veterans who were eligible for the study; §P < 0.05; ||P < 0.01. DBP, diastolic blood pressure; SBP, systolic blood pressure.

without IHD compared with those with IHD. There were 2,645 veterans (79% of those with blood pressure measures) who either self-reported hypertension or who had systolic blood pressure ≥140 mmHg or diastolic ≥90 mmHg. The prevalence of hypertension was slightly more common in veterans with than without IHD.

Among veterans with self-reported hypertension, nonpharmaceutical interventions for hypertension were virtually universal and did not differ among those with and without IHD: 95 and 96%, respectively. Pharmaceutical interventions, however, were more common in those with IHD than in those without IHD (Table 3). Not surprisingly, β-blockers and calcium antagonists, which are also indicated for anginal symptoms, were more likely to be used by veterans with IHD. On average the IHD group also used a larger number of antihypertensive therapies. ACE inhibitors and angiotensin II receptor antagonists were the preferred antihypertensive treatment for both

groups. Self-reported compliance was identical across both groups. Optimal blood pressure levels were not equally achieved: diabetic veterans without IHD were half as likely to have systolic blood pressure levels ≤129 mmHg and diastolic levels ≤84 mmHg compared with diabetic veterans with IHD.

Data on LDL, HDL, and triglycerides were available for 2,382 (63%), 2,201 (58%), and 377 (10%) veterans, respectively. We found that both LDL and HDL measures were lower for veterans with IHD compared with those without. Dyslipidemia was more common in persons with IHD yet equally likely to be treated. Statin use was higher in IHD patients. Veterans with IHD were more likely to be controlled to optimal levels than in those without IHD.

In post hoc analyses, we calculated the level of glucose and blood pressure control according to levels reported for other veteran populations. We found that overall 89% of veterans had HbA<sub>1c</sub> values <10%, 33% had blood pressure levels ≤140/90 mmHg, 75% had blood pressure levels <160/90 mmHg, and 66% had LDL level ≤130 mg/dl.

**CONCLUSIONS** — Hyperglycemia, hypertension, and dyslipidemia were very common among veterans who self-reported diabetes in this sample of pri-

**Table 4 —Dyslipidemia treatment and control among veterans with self-reported diabetes who only use VA medical services, ACQUIP, 1997–1998**

	Self-reported IHD*	
	Absent (n = 2,158)	Present (n = 1,611)
Mean LDL cholesterol (mg/dl)†	120	115¶
Mean HDL cholesterol (mg/dl)‡	42	39¶
Mean triglycerides (mg/dl)§	161	183
Dyslipidemia (%)	53	81¶
Dyslipidemia (n)	689	884
Treated (%)	50	54
Treated dyslipidemia (n)	347	482
Statin therapy (%)	84	91¶
Optimal: <100 mg/dl (%)	16	30¶
Borderline: 100–129 mg/dl (%)	33	39
High: ≥130 mg/dl (%)	50	32

\*Self-reported history of angina, coronary artery disease, myocardial infarction, or coronary revascularization procedure; †LDL cholesterol measures were available for 2,382 veterans (63%) from among the 3,769 veterans with self-reported diabetes; ‡HDL cholesterol measures were available for 2,201 veterans (58%) from among the 3,769 veterans with self-reported diabetes; §triglyceride measures were available for 377 veterans (10%) from among the 3,769 veterans with self-reported diabetes; ||Dyslipidemia = LDL cholesterol ≥130 mg/dl for those without prevalent cardiovascular disease or >100 mg/dl for those with prevalent cardiovascular disease, or treatment with antilipidemic therapy; ¶P < 0.01.

mary care patients. More than 90% of veterans reported diabetic symptoms in the past 6 months and <50% had glycemic control, either by self-report or by HbA<sub>1c</sub> values  $\leq$ 8%. These percentages varied little by self-reported IHD. Curiously, 25% of the veterans were not receiving antidiabetic treatment, yet 37% of these subjects had HbA<sub>1c</sub> values >8%.

Nearly four-fifths of the veterans had hypertension, which was slightly more prevalent in those with IHD. Antihypertensive treatment appeared to be approached more aggressively in those with IHD, for which hypertension was treated more often and with more antihypertensive agents. Although the proportion of self-reported compliance with medications was very high, only 1 in 5 veterans with IHD were achieving optimal blood pressure measures, while only 1 in 10 veterans without IHD were achieving such measures. And although dyslipidemia was more prevalent in those with IHD—owing primarily to a lower LDL threshold—the prevalence of treatment did not differ by IHD. Optimal LDL levels were achieved by one in three veterans with IHD compared with one in six veterans without IHD.

There are several possible explanations for our findings. One explanation might be that clinicians approach cardiovascular risk factor treatment more aggressively in diabetic veterans with IHD than in veterans without IHD. Veterans with IHD reported worse health compared with those without IHD. This health differential may have motivated clinicians to intervene more aggressively to prevent further health deterioration. This explanation—if correct—suggests that clinicians should be encouraged to approach risk factor control more aggressively in diabetic veterans without IHD since lower levels appear achievable. A second is that veterans with IHD are better motivated to control cardiovascular risk factors given their clinical history and poorer health status. Self-reported compliance with antidiabetic and antihypertensive treatment was reported as often in veterans without IHD as in those with IHD and suggests similar motivations to adhere to treatment regimens. A third explanation might be that it was easier to lower blood pressure and LDL in veterans with IHD compared with those without IHD. However, some clinical trial data suggest otherwise (11,12).

VA national performance evaluation data collected from a sample of medical records in 1999 corroborated our results and found that 86% of veterans with diabetes had HbA<sub>1c</sub> values <10%. Performance data also showed that 42% of diabetic veterans were achieving blood pressures  $\leq$ 140/90 mmHg and 71% had LDL values  $\leq$ 130 mg/dl. These figures compare to the 33 and 66% figures, respectively, reported in the present study. One explanation for the difference may be that blood pressure control in 1999 was actually better than that reported for 1996–1998 and that the increased control may be a response to the 1997 U.K. Prospective Diabetes Study publication demonstrating decreased cardiovascular risk attributable to increased blood pressure control in persons with diabetes (13). The 5% difference in LDL levels reinforces the notion that cardiovascular risk factor control may be improving among veterans with diabetes. A published study on hypertension data collected during 1990–1995 from veterans visiting outpatient clinics in New England (average age 65.5 years, 100% male, 92% white, 34% diabetic) found that 61% were achieving blood pressures <160/90 mmHg (14), which was 14 points below the percent found in the ACQUIP data. Results were not stratified according to diabetes status so a head-to-head comparison of control cannot be presented.

### Limitations

This study relies on self-report to determine diabetes status, which may have been reported differentially in those with and those without IHD. To determine the effect that misclassification may have had, data were reanalyzed and restricted to those who were currently being treated with antidiabetic medications, a more reliable indication of diabetes. The proportion with and without IHD did not change, and the findings concerning risk-factor control did not differ from the findings reported above.

Laboratory and pharmacy data were collected and averaged over the 365 days before and after the enrollment date. This 2-year measurement interval increased the possibility of identifying drugs that were not regularly used to treat a veteran's diabetes, hypertension, or dyslipidemia. The interval may have also reduced measurement precision by averaging labora-

tory values that may have changed in response to new treatments or other clinical situations that arose during the 2-year interval. Laboratory data, especially lipid measures, were missing for many of the veterans in the study. We do not know if the missing data represent measures that were not taken or measures that were just not recorded electronically. We did not have access to medical records to confirm or refute the absence of data. We also did not have information on the indication for the cardiovascular drugs.  $\beta$ -Blockers and calcium antagonists are used to treat both hypertension and angina pectoris, and we assumed in our analyses that they were used to treat hypertension if the veteran self-reported hypertension.

We excluded 39% of veterans who reported that they received health care from outside the VA in order to maximize the completeness of pharmacy and laboratory data. The seven primary care clinics chosen for this study were not a random sample of all primary care clinics within the VA. The clinics were selected to maximize research validity and feasibility and not necessarily to increase the generalizability of the findings. As such, findings from this report should be generalized cautiously and only to male veterans who receive all their health care from the VA system.

Guidelines for the treatment of diabetes, hypertension, and dyslipidemia have changed and presumably will continue to change through time. We have presented the most recent recommendations at the time of publication, knowing that some guidelines may not have been published or disseminated at the time of data collection.

### Summary

Optimal cardiovascular risk factor control was the exception in this cohort of diabetic veterans attending primary care clinics. Thirty percent of veterans with treated hypertension and IHD were achieving optimal blood pressure control, and 20% of veterans with dyslipidemia and IHD were achieving optimal LDL levels. Veterans without IHD had half the levels of optimal control. More aggressive management of cardiovascular risk factors in veterans with diabetes may be warranted, especially among those without prevalent IHD.

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