Comparative effectiveness of outpatient cardiovascular disease and diabetes care delivery between advanced practice providers and physician providers in primary care: Implications for care under the Affordable Care Act

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Background The objective was to compare quality of diabetes and cardiovascular disease (CVD) care between advanced practice providers (APPs) and physicians in a primary care setting.

Methods We identified diabetes (n = 1,022,588) and CVD (n = 1,187,035) patients receiving primary care between October 2013 and September 2014 in 130 Veterans Affairs facilities. We compared glycemic control (hemoglobin A1c < 7%) in diabetic patients, blood pressure (BP) < 140/90 mmHg in diabetic or CVD patients, cholesterol control (low-density lipoprotein cholesterol < 100 mg/dL, receiving a statin) in diabetic or CVD patients, and those receiving a β-blocker (with history of myocardial infarction in the last 2 years) among patients receiving care from physicians and APPs. We also compared the proportion meeting composite measure (glycemic, BP, and cholesterol control in diabetic patients; BP, cholesterol control, and receipt of β-blocker among eligible CVD patients).

Results Diabetic patients receiving care from APPs were statistically more likely to have glycemic (50% vs 51.4%, odds ratio [OR] 1.06 [1.05-1.08]) and BP control (77.5% vs 78.4%, OR 1.04 [1.03-1.06]), whereas patients receiving care from physicians were more likely to have cholesterol control [receipt of statin 68% vs 66.5%, OR 0.94 [0.93-0.95]] in adjusted models, although these differences are not clinically significant. Similar results were seen in CVD patients. Few patients met the composite measure (27.1% and 27.6% of diabetic and 54.0% and 54.8% of CVD patients receiving care from physicians and APPs, respectively).

Conclusions Diabetes and CVD care quality was comparable between physicians and APPs with clinically insignificant differences. Regardless of provider type, there is a need to improve performance on eligible measures in diabetes or CVD patients. (Am Heart J 2016;181:74-82.)

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The United States has fewer primary care physicians per capita than any other industrialized country (30 per 100,000 population compared with 80 in the United Kingdom, 159 in France, and 157 in Germany). In a recent Commonwealth Fund survey, 16% of US adults reported having to wait ≥6 days to see a primary care physician when needing care. Only about one-quarter of medical school graduates in the United States plan careers as primary care physicians. It is estimated that slightly less than one-third of the practicing physicians, 52% of the nurse practitioners (NPs), and 43% of the physician assistants (PAs) were providing primary care in 2010. According to estimates from the Association of American Medical Colleges, the United States will face a shortage of 45,000 primary care physician by 2020, which will increase to 65,000 by 2025.

With the implementation of the Affordable Care Act, approximately 30-40 million Americans will secure health care coverage and access to primary health care. With an increasing prevalence of obesity and other cardiovascular risk factors in the general US population, these previously uninsured Americans will likely also suffer from various noncommunicable diseases including diabetes and cardiovascular disease (CVD). Given this increase in the number of Americans seeking primary care, combined with current and anticipated physician shortages, there is a growing need to identify other models of primary care delivery to address chronic diseases in this large number of previously uninsured Americans.

A possible solution to this has been to expand the scope of practice laws to advanced practice providers (APPs) (NPs or PAs) to perform their clinical duties independently. However, questions remain whether the quality of chronic disease care delivered is comparable between physician and APPs. Although prior studies have compared chronic disease management between NPs and physician providers, most studies were performed in urban academic medical centers, limiting the generalizability of these findings to nonacademic and rural settings, and mostly evaluated one of the domains of the effectiveness of care (eg, blood pressure [BP] control or cholesterol control) and did not evaluate multiple domains in the care of a chronic condition. Similarly, although some recent studies using large databases have shown comparable effectiveness of CVD care between physicians and APPs in specialty care, the difference in the effectiveness of delivery between physicians and APPs has not been evaluated in large health care systems using contemporary data in a primary care setting.

Using clinical and administrative data sources from the Department of Veterans Affairs (VA) Health Care System, our aim was to evaluate whether the effectiveness of primary care delivery for diabetes and CVD is comparable between patients receiving care from physician and APPs. We hypothesized that there would be no clinically meaningful differences in the quality of diabetes or CVD care between patients receiving care from physicians and those receiving care from APPs.

**Methods**

**Cohort development, and inclusion and exclusion criteria**

Using clinical and administrative data, we identified patients with diabetes or CVD seeking care in 130 VA facilities and their affiliated community-based outpatient clinics with a primary care visit during VA fiscal year 2014 (October 1, 2013, to September 30, 2014). We included 100% of VA facilities. Therefore, all states and territories were included in the analysis. For each patient, we used the most recent primary care visit if a patient had multiple primary care visits during the study interval. Patients with CVD were defined as those with a prior history of ischemic heart disease (IHD), peripheral artery disease (PAD), or ischemic cerebrovascular disease (ICVD) and were identified using International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM) diagnoses and procedure, or current procedural terminology codes (Supplemental Table I) using well-validated methodology as described in prior studies. We included patients with at least 2 outpatient diagnoses codes or 1 inpatient diagnosis code for unstable angina, or 1 code for myocardial infarction (MI), percutaneous coronary intervention, or coronary artery bypass graft. Based on prior literature, we also used exclusion criteria to improve specificity for the diagnosis of PAD (Supplemental Table II). Using this methodology, we found an overall positive predictive value of 88% for identification of patients with CVD compared with manual chart review of 100 random CVD patients. We classified patients as having diabetes if any of the following were documented: 2 outpatient ICD-9-CM diagnoses or 1 inpatient ICD-9-CM diagnosis code indicating diabetes (250.xx, 357.2, 366.41), filled prescription for diabetes medications, any fasting glucose ≥126 mg/dL, hemoglobin A1c (HbA1c) ≥6.5%, or at least 2 outpatient blood glucose readings ≥200 mg/dL on 2 different days. As patients with metastatic cancers and those receiving hospice care are not considered candidates for quality measurement, we excluded these patients from our cohort (Supplemental Table III).

**Study population**

We created 2 separate cohorts of patients (one with diabetes and one with CVD). For the diabetes cohort (Figure 1), we initially identified patients with diabetes and a primary care visit during VA fiscal year 2014 (n = 1,483,164). Following this, we excluded patients with metastatic cancer or those receiving hospice care (n = 23,539); patients with unknown sex or date of birth or those in whom medication records could not be reconciled (n = 12,343); and those with no assigned primary care