Pharmacist-Physician Collaborative Practice to Improve Diabetes Care at Tampa General Medical Group

Kevin Cowart,[1,2,3,4] *Vidhi Patel,*[4] *Jessica Bianco,*[1] *Amanda Martinez,*[1] *and Jason Castro*[1]

Quality Improvement Success Stories are published by the American Diabetes Association in collaboration with the American College of Physicians and the National Diabetes Education Program. This series is intended to highlight best practices and strategies from programs and clinics that have successfully improved the quality of care for people with diabetes or related conditions. Each article in the series is reviewed and follows a standard format developed by the editors of *Clinical Diabetes*. The following article describes a pharmacist-physician collaborative effort to reduce A1C and blood pressure and thereby lower risks for complications for people with diabetes being treated at a network of family care clinics in the Tampa, FL, area.

Describe your practice setting and location.

Tampa General Medical Group (TGMG) is an affiliate of Tampa General Hospital (TGH) located in Tampa, FL. TGMG consists of 16 primary and specialty practices (cardiology, hepatology, organ transplant, endocrinology, gastroenterology, pediatrics, and surgery) across West Central Florida. Most TGMG clinics are level 3 National Committee on Quality Assurance patient-centered medical homes and serve a diverse patient population. The TGH Pharmacy Department provides ambulatory clinical pharmacy services to patients at TGH's Family Care Center (FCC) clinics. Ambulatory clinical pharmacy services are provided by clinical pharmacists with specific knowledge of and training in ambulatory care medication management. Services include, but are not limited to, anticoagulation management, diabetes education and management, drug regimen review, infusion services, medication/allergy reviews, and patient education/medication teaching.

Describe the specific quality gap addressed through the initiative.

It was recognized that patients with poor glycemic control as assessed by A1C were at the greatest risk of negative health outcomes in our practices, including the development of macro- and microvascular complications and hospitalizations. The primary focus of this program was to reduce the percentage of patients with diabetes who had an A1C >8%. A secondary goal was to reduce the number of patients with diabetes who had a blood pressure >140/90 mmHg. Together, glycemic and blood pressure control are important quality measures for outpatient care at TGMG.

How did you identify this quality gap? In other words, where did you get your baseline data?

To identify the quality gap, a report from the TGH Office of Clinical Research was obtained that included established adult patients aged 18–80 years with type 2 diabetes and metabolic syndrome who had at least one visit with their primary care provider (PCP) at TGMG in the previous year. Diagnosis of metabolic syndrome was defined as having any two of the following risk factors in addition to an A1C >8%: BMI >30 kg/m^2, triglycerides ≥150 mg/dL, HDL cholesterol <40 mg/dL in men or <50 mg/dL in women, and systolic blood pressure ≥130 mmHg or diastolic BP ≥80 mmHg.

Patients included in the pharmacist-physician collaborative practice (PPCP) cohort had at least one in-person

[1]Tampa General Medical Group, Tampa, FL; [2]University of South Florida Taneja College of Pharmacy, Tampa, FL; [3]University of South Florida Morsani College of Medicine, Tampa, FL; [4]University of South Florida College of Public Health, Tampa, FL

Corresponding author: Kevin Cowart, kcowart2@usf.edu

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pharmacist visit in addition to their routine PCP or specialist visits. Those included in the usual care (UC) cohort were patients who did not have an in-person pharmacist visit during the study time frame. Patients in the PPCP cohort were selected for inclusion from seven different TGMG FCC clinics with imbedded clinical pharmacists. Patients in the UC cohort were selected from TGMG FCC clinics without an imbedded clinical pharmacist. To further evaluate the impact of the in-person PPCP intervention, we excluded any patients with a documented clinic visit with an endocrinologist, telehealth pharmacist visit, or diabetes self-management education (DSME) course within TGH during the study time frame. Patients with type 1 diabetes or confirmed pregnancy were also excluded.

Summarize the initial data for your practice (before the improvement initiative).

Baseline characteristics of the PPCP and UC groups are shown in Table 1. The cohorts were compared on age, BMI, race, smoking status, blood pressure, and A1C based on the first visit during the study time frame, which we termed their "index visit." χ^2 and Student *t* tests were used to compare the two groups, where appropriate. The primary composite outcome was the number of patients achieving an A1C <8% and a blood pressure <140/90 mmHg in the PPCP and UC cohorts in the time period after the index visit. We also analyzed the proportion of patients in each cohort who achieved either an A1C <8% or a blood pressure <140/90 mmHg, as well as the mean change in these outcomes from baseline to study end.

A total of 698 patients were included in the evaluation of this program (83 patients in the PPCP cohort and 615 patients in the UC cohort). For the PPCP cohort, the mean baseline A1C was 9.6% (SD 2.02%), mean BMI was 37.4 kg/m^2, mean systolic blood pressure was 143 mmHg, and mean diastolic blood pressure was 81 mmHg. In the UC cohort, mean baseline A1C was 9.1% (SD 1.9%), mean BMI was 36.5 kg/m^2, mean systolic blood pressure was 142 mmHg, and mean diastolic blood pressure was 78 mmHg.

What was the time frame from initiation of your quality improvement (QI) initiative to its completion?

We evaluated achievement of A1C <8% and blood pressure <140/90 mmHg between 1 January 2014 and 31 December 2016 across 12 TGMG FCC clinics, among patients aged 18–80 years with type 2 diabetes and metabolic syndrome.

TABLE 1 Baseline Characteristics

Variables	PPCP (*n* = 83)	UC (*n* = 615)	*P*
Age, years	52.6 ± 11.3	56.8 ± 12.1	0.003
BMI, kg/m^2	37.4 ± 8.3	36.5 ± 10	0.3528
Total PPCP visits	6.3 ± 9.9	–	
Race, *n* (%)			<0.0001
White	24 (28.9)	365 (59.3)	
Black/African American	43 (51.8)	177 (28.7)	
Asian	1 (1.2)	9 (1.4)	
Puerto Rican	2 (2.4)	7 (1.1)	
Other	13 (15.6)	47 (7.6)	
Missing	0	10 (1.6)	
Tobacco use, *n* (%)			0.0132
Current	21 (25.3)	75 (12.2)	
Former	21 (25.3)	174 (28.2)	
Never	41 (49.4)	365 (59.3)	
Missing	0 (0)	1 (0.1)	
Blood pressure, mmHg			
Systolic	143 ± 19	142 ± 16	0.5752
Diastolic	81 ± 15	78 ± 11	0.1751
A1C, %	9.6 ± 2	9.1 ± 1.9	0.0214

Data are mean ± SD or *n* (%).

Describe your core QI team. Who served as project leader, and why was this person selected? Who else served on the team?

The core QI team consisted of an ambulatory care medical director, a physician champion, and individual physicians and clinical pharmacists at each TGMG FCC clinic. The ambulatory care medical director oversaw operation for all ambulatory care clinics within TGH and TGMG. A physician champion was selected to help with promotion of the initiative to PCPs at each TGMG FCC clinic. The physician champion also assisted in policy and procedure development for the QI initiative. At each clinic, a supervising physician was designated to oversee the day-to-day operation of the QI initiative and serve as a resource for emergency and medical issues. The supervising physician also served as the authorizing physician for billable services provided by the clinical pharmacists.

Describe the *structural* changes you made to your practice through this initiative.

This QI program involved imbedding clinical pharmacists into the TGMG FCC clinics to improve diabetes care. Clinical pharmacists used incident-to billing strategies in collaboration with PCPs and developed a

collaborative practice agreement (CPA) in alignment with state Board of Pharmacy statutes. Incident-to billing is a mechanism commonly used by pharmacists to generate revenue for clinical services in outpatient settings and is defined as services furnished incident to physician professional services in the physician's office. In this model, the physician bills for the service, although the pharmacist furnishes the service incident to the professional service of the physician. Overall, there was minimal disruption in workflows for clinic operations, telephone scheduling, check-in/check-out and front desk procedures, and billing operations. The clinical pharmacists were able to function similarly to providers from the perspective of patient scheduling, clinical documentation, and communication with patients/medical staff in the electronic health record (EHR).

Describe the most important changes you made to your *process* of care delivery.

PCPs were educated on the QI program at department meetings and encouraged to refer patients with uncontrolled or new-onset type 2 diabetes to the QI program. Order sets were created in the EHR allowing providers to place a referral for a pharmacotherapy consultation to a clinical pharmacist for either diabetes education and management or diabetes education.

The clinical pharmacist scheduled patients for a 30- to 60-minute initial in-person visit and determined follow-up based on clinical judgment. Under the CPA, clinical pharmacists were authorized to obtain vital signs and anthropometrics (e.g., height and weight) and to order and interpret appropriate laboratory tests secondary to diabetes, including, but not limited to, basic or complete metabolic panel, A1C, lipid panel, creatinine phosphokinase, and urine albumin-to-creatinine ratio. Clinical pharmacists were also authorized to initiate or make dosage adjustments for any oral diabetes medication and/or insulin based on laboratory test values and/or blood glucose logs maintained by patients. Based on judgment, clinical pharmacists were authorized to order referrals for Ophthalmology, Podiatry, or a 2-day comprehensive DSME course led by a diabetes educator and clinical pharmacist at TGH. This course was a key part of the pharmacy-led QI initiative. Alternatively, one-on-one diabetes education could be provided by the pharmacist.

Clinical pharmacists also provided recommendations for aspirin, ACE inhibitor/angiotensin receptor blocker therapy, and statin medications based on vital signs and laboratory test results. All protocols were created based on recommendations in the American Diabetes Association Standards of Medical Care in Diabetes guidelines. These recommendations were made the same day of the appointment and sent through the EHR to the PCP. If accepted, the clinical pharmacist was authorized to place an order for the medication with cosignature by the PCP.

Additional education and over-the-counter product recommendations for smoking cessation were provided, if warranted. At each visit, the clinical pharmacist screened for drug-drug, drug-food, and drug-disease state interactions, as well as adverse drug effects and medication compliance. It was up to the clinical pharmacist's discretion to select a database (e.g., Lexicomp or Micromedex) to evaluate interactions. If identified, drug-related problems and pertinent findings were communicated to the PCP so the patient would receive appropriate medical attention.

Summarize your final outcome data (at the end of the improvement initiative) and how it compared with your baseline data.

As shown in Table 2, the primary composite outcome of attainment of an A1C <8% and a blood pressure <140/90 mmHg was achieved by 68.6% of patients in the PPCP group compared with 60.6% of patients in the UC group ($P = 0.1583$). This difference appeared to be driven by blood pressure, with 100% of the patients in the PPCP group achieving a measurement <140/90 mmHg at least once during the study time frame after the index visit. Comparatively, 90.7% of patients in the UC group achieved this blood pressure target ($P = 0.0038$).

A significant reduction in mean A1C (−0.9% [SD 2.2%], interquartile range [IQR]−2.5 to 0.3) was found in the PPCP group compared with a small increase in mean A1C (0.1% [SD 1.8%], IQR 0.1–1.1) in the UC group from baseline to the end of the intervention ($P <0.0001$). Additionally, a significantly greater reduction in systolic blood pressure was found in the PPCP group (−10.4 mmHg [SD 21 mmHg], IQR −24 to 3) as compared with the UC group (−3.5 mmHg [SD 19.6 mmHg], IQR −14 to 8) from baseline to study end ($P = 0.0062$). A similar trend was observed for change in diastolic blood pressure from baseline to study end (−6.3 mmHg [SD 15.9 mmHg], IQR −14 to 3) in the PPCP group versus −1.4 mmHg [SD 11.9 mmHg], IQR −8 to 5, in the UC group; $P = 0.0088$).

Achievement of diabetes-related outcomes (i.e., A1C and blood pressure), in addition to progress on the QI

TABLE 2 Primary and Secondary Outcomes

	PPCP (n = 83)	UC (n = 615)	P
Outcome			
Composite primary outcome (achievement of A1C <8% and blood pressure <140/90 mmHg)	57 (68.6)	373 (60.6)	0.1583
Achievement of A1C <8%	57 (68.6)	434 (70.5)	0.59
Achievement of blood pressure <140/90 mmHg	83 (100)	558 (90.7)	0.0038
Change in outcomes from baseline to study end			
A1C, %	−0.9 (2.2)	0.1 (1.8)	<0.0001
Systolic blood pressure, mmHg	−10.4 (21)	−3.5 (19.6)	0.0062
Diastolic blood pressure, mmHg	−6.3 (15.9)	−1.4 (11.9)	0.0088

Data are n (%) or mean ± SD.

program, were shared with PCPs at quarterly and department meetings.

What are your next steps?

To support the expansion of our QI program, we have added additional billable clinical services, including chronic care management and transitional care management. These services offer a higher reimbursement than billing codes used traditionally by clinical pharmacists in primary care settings (i.e., Current Procedural Terminology code 99211) and have also allowed the clinical pharmacists to provide more comprehensive, focused medication assessments. As a result, the CPA for chronic disease state management has also expanded. Patients also now have the option to schedule a visit with a pharmacist through our health system's electronic patient portal as well as receiving a referral from their PCP. To support these pharmacy-led initiatives, three additional full-time clinical pharmacists and two additional part-time clinical pharmacy faculty member positions have been added since 2017.

In response to the coronavirus pandemic, we have expanded the use of telehealth so that all of our clinical pharmacists are able to schedule visits virtually, and we now offer virtual pharmacist-led DSME classes to ensure that a greater number of patients have access to diabetes education. We are also in the process of developing a pharmacist-led continuous glucose monitoring service across the TGMG FCC clinics.

To improve the assessment of our pharmacy-led initiatives, we are working on a more effective process for generating outcomes from the EHR. This effort has included generation of quarterly reports at each clinic to evaluate diabetes-related quality measures. We have also begun focusing on population health and now work in collaboration with population health nurses at each TGMG clinic to improve quality measures and address gaps in care. We will also be partnering with payors to identify high-risk patients.

What lessons did you learn through your QI process that you would like to share with others?

Not every clinic within TGMG has an imbedded clinical pharmacist. For patients without a clinical pharmacist in their PCP clinic, we have been able to offer our QI program using telehealth to expand the program to more clinics. To mitigate low attendance at DSME classes, we developed a 2-hour online class that several patients can attend virtually at the same time. Being flexible and ready for change based on the clinics' or institution's needs has been necessary.

Clear communication regarding pharmacists' scope of practice, along with PCP and provider buy-in was necessary early on, while building the QI program and establishing new structures and processes for diabetes care. This effort was important for PCPs who may not have been familiar with or have worked with a clinical pharmacist in the outpatient setting prior to implementing the QI program. It was also imperative to work closely with the compliance office to ensure appropriate billing for clinical services.

Finally, many patients referred to the QI program required a holistic patient-centered approach to

diabetes care. Financial, social, educational, and cultural barriers exist for many patients, and having a multidisciplinary team approach has been essential to improving diabetes care in our clinics. To demonstrate value, diabetes care teams may consider collecting additional quality measures beyond A1C and blood pressure, including screening for retinopathy, nephropathy monitoring, and lipid control. Tracking the interventions responsible for changes in these outcomes may help to support a QI program and can help an institution determine whether guideline-directed care is being provided.

DUALITY OF INTEREST

No potential conflicts of interest relevant to this article were reported.

AUTHOR CONTRIBUTIONS

K.C. contributed to the conception and initial draft of this article. K.C. and V.P. contributed to the data analysis. J.B., A.M. and J.C. contributed to revisions and editing. All authors contributed meaningfully to important intellectual content. K.C. is the guarantor of this work and, as such, had full access to all the data presented and takes responsibility for the integrity of the data and the accuracy of the content.