



# Connecting the Dots: An Interdisciplinary Diabetes Quality Improvement Initiative

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■ **IN BRIEF** “Quality Improvement Success Stories” are published by the American Diabetes Association in collaboration with the American College of Physicians, Inc., (ACP) 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 collaborative effort to improve the care of patients with diabetes, with a particular focus on scheduling annual diabetic eye exams, attending to recommended quality metrics, and improving the availability of blood glucose monitoring data during appointments.

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## **Describe your practice setting and location.**

The Richmond, Va., metropolitan area is the nation's 45th largest, with a population of 1.3 million. Virginia Commonwealth University (VCU) Health is located in central Virginia, where 9% of the population has diabetes. The participating clinics included Internal Medicine (resident and women's health clinics), Family Medicine, and Endocrinology. Practices have diverse patient populations, including government and commercially insured patients and, in the resident practice, 30–55% of patients are indigent.

## **Describe the specific quality gap addressed through the initiative.**

The project was a collaborative effort between the American College of Physicians (ACP) Quality Connect quality improvement (QI) initiative and VCU Health that continued to build on the organization's QI efforts focused on patients living with diabetes who are cared for in diverse

ambulatory clinics. The ACP Quality Connect initiative is a grant-funded program supporting health care QI across the nation, including in the realms of diabetes, adult immunizations, and chronic pain management. The program provides expert staff assistance, a national advisory group, financial support, training in QI, and professional evaluation of program impact. Patient selection included those with an A1C >8% for whom recommended diabetes quality metrics were not being accomplished in a timely manner. Emphasis was placed on scheduling annual diabetic eye exams, attending to American Diabetes Association (ADA)-recommended quality metrics, and improving the availability of blood glucose monitoring data during appointments using smartphone apps.

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

VCU Health developed an electronic diabetes registry for each of the in-

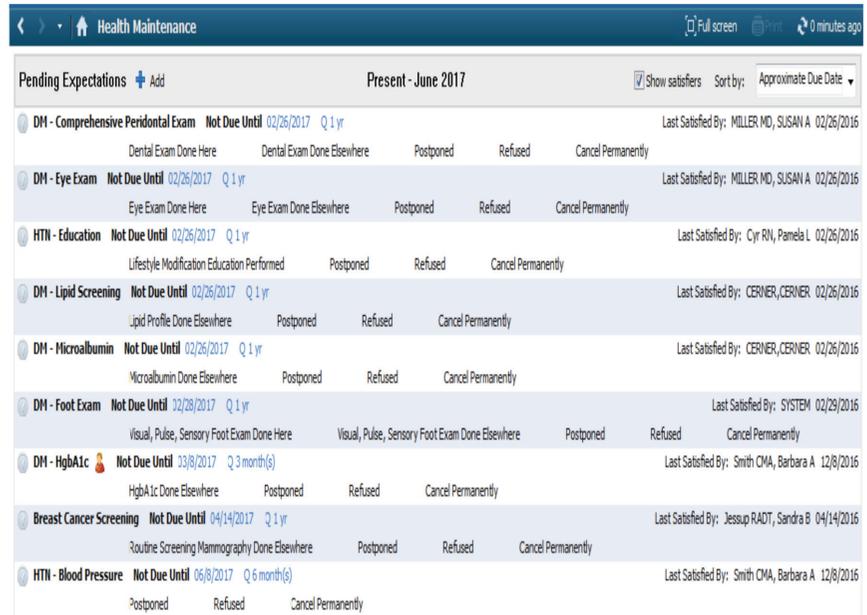
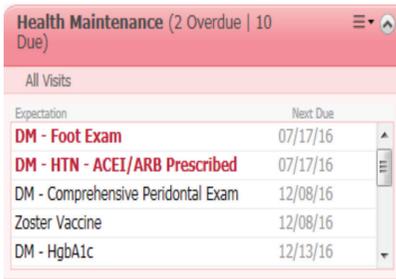


FIGURE 1. Electronic health maintenance tool and sample scheduled updates.

involved clinics (with the exception of endocrinology, which is still working to develop this) to track recommended quality metrics, including but not restricted to A1C, urinary microalbumin, lipids, and blood pressure. Representatives from each clinic met together over the course of a year to examine current practices related to diabetes care. Through this collaboration, each clinic identified an area or areas that warranted improvement. We then met monthly to discuss and problem-solve practice-level strategies.

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

Initial relevant data for the participating clinics included:

- Internal Medicine resident clinic: 780 patients with diabetes, 36% with an A1C >8%
- Internal Medicine women’s health clinic: 486 patients with diabetes, 13% with an A1C >8%
- Family Medicine clinic: 630 patients with diabetes, 34% with an A1C >8%
- Endocrinology clinic: No database available

**What was the timeframe from initiation of your QI initiative to its completion?**

We identified leaders for the project in July 2015, before meeting with the Virginia Center for Health Innovation in August 2015 to identify care measures that were considered important to the state. The ACP advisory group meeting was held on 23 November 2015, and the program began with the ACP Quality Connect Pre-Conference at the ACP annual meeting in April 2016. The program duration was 9 months.

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

The core leadership team was led by an organizational leader in patient-centered medical home transformation for Family Medicine and a clinical nurse specialist with a population health focus in diabetes. The team was assisted by a master’s in public health student, who acted as the program manager and handled logistics and information distribution. Physician champions included

the medical director of the resident clinic and providers from the women’s health and outpatient endocrinology clinics. Nursing champions from the involved clinics also formed part of the team, as did a pharmacist and the director of VCU’s dietetic internship program. This QI project allowed previously siloed clinical entities to work together across the institution.

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

We met monthly to review progress and data. All clinics shared resources, including the electronic patient registry, a shared electronic inter-professional note, a diabetes care set, standardized educational materials, and an electronic health maintenance tool (Figure 1). The diabetes care set includes electronic orders for routine diabetes laboratory tests, referrals, and medications, including orders for testing equipment that contain the required elements for Medicare approval and medications that are available in our pharmacy formulary and in \$4 formularies in the community. Educational information regarding the ADA guidelines, such

as indications for the use and dose of a statin or aspirin prophylaxis, has been embedded within the order set. Although the tools had been developed as part of an earlier institutional initiative to standardize diabetes care, their shared use in routine clinical care and in tracking QI really began during the ACP QI project.

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

#### ***Internal Medicine Resident Clinic***

The practice created a paper sheet of diabetes metrics, including A1C, eye exam, foot exam, vaccines, laboratory measures, and dental exam, to prompt rooming staff regarding needed quality metrics, which were subsequently shared with the physician so orders could be placed. The sheet included check boxes to indicate whether a specific diabetes metric was due; this prompted the resident to enter an order at the time of the visit.

The practice also obtained permission from Ophthalmology to directly schedule patients for their annual eye examinations (when they were already scheduled for a primary care appointment). This was done over a 3-month timeframe.

#### ***Women's Health Clinic***

As in the resident clinic, the practice developed a health maintenance checklist with diabetes metrics, including A1C, eye exam, foot exam, vaccines, laboratory measures, and dental exam) for the check-in nurses to complete so the physician could then place orders for needed care.

Monofilaments were provided by the nursing staff for foot exams, and feet were exposed for examination.

#### ***Family Medicine Clinic***

The practice identified a high incidence of undocumented foot exams in the diabetes registry. The team collected data from seven providers and found high practice variability that was related to documentation rather than actual patient care. The first

project undertaken by the clinic was a plan/do/study/act (PDSA) cycle, which included using scribes to document the foot exam in the clinic note and having nurses ask patients to remove their shoes and set out a monofilament at visits related to diabetes care. The second PDSA project was to complete A1C testing in a timely manner. The front desk staff called all patients who had not been seen in a year. The A1C interval was changed from 6 months to 3 months in the health maintenance tool for patients with an A1C >7%. The intervention started with one practitioner's panel; once it was shown to be successful, it was spread as standard practice throughout the clinic.

#### ***Endocrinology Clinic***

The clinic identified as the biggest barrier to workflow the lack of blood glucose data regularly available for review during clinic visits. Glucose meter and insulin pump downloads are time-consuming and can be affected by technical difficulties. We aimed to improve the rate of patients presenting to the clinic having already downloaded their glucose meter or insulin pump data outside of the clinic for review. Through successive PDSA cycles, the clinic was able to tailor teaching strategies and revise the clinic discharge sheet to improve patients' engagement in diabetes self-management skills, teach the use of smartphone apps to track glucose data, improve patient comfort with reviewing glucose data, and improve patient-provider communication through the use of the patient portal that is embedded in our electronic health record (EHR).

All of the clinics participated in the development of new roles for registered nurses to participate in population work in the clinics and to use the diabetes registry.

The director of dietetic internship program worked to expand the availability of nutritionists to clinics, a resource that was not previously available.

### **Summarize your final outcome data (at the end of the improvement initiative) and how it compared to your baseline data**

#### ***Resident Clinic***

The electronic diabetes registry was useful in determining the impact of the initiative on A1C levels and on obtaining urinary microalbumin results. To determine the outcome of the eye exam intervention, we had to manually track the scheduling of annual diabetic eye exams because we were not able to capture this electronically. The percentage of patients with an A1C >8% fell from 36% at baseline to 21% at the end of the initiative. Taking into consideration fluctuations in the clinic population, this reflected ~93 patients whose A1C moved into the <8% range. There was a small increase in the percentage of patients for which we obtained urinary microalbumin results. There was a significant improvement in the number of patients scheduled for diabetic eye examinations. In August of 2016, 22% of patients needed an exam, and 11% of those were scheduled. In September, 40% needed exams, and 23% of those were scheduled. In October, 9% needed exams, and 5% of those were scheduled.

#### ***Women's Health Clinic***

We used the microalbumin metric from the health maintenance form to measure improvement and measured each physician's outcome before, during, and after the PDSA cycle. A total of 22% of patients had microalbumin measurements in a timely manner before, 39% during, and 56% after the intervention.

#### ***Family Medicine Clinic***

From December 2015 to December 2016, the number of patients with diabetes with a documented foot exam increased from 12 to 82% (in a patient population of 630). Having scribes document the exam correctly in the office note improved data capture of the foot exam in the health

maintenance tool. The changes made to the A1C reminder in the health maintenance tool moved the measurement rates from 22 to 58% in 3 months in the pilot PDSA cycle.

**Endocrinology Clinic**

At baseline, none of the patients were downloading insulin pumps or glucose meters at home. By the end of 7 months, the rate had increased to 20–30% of patients per clinic session, and 60% of patients remained open to continued discussion about how to download at home.

**What are your next steps?**

**Resident Clinic**

Improving resident attention to health maintenance forms is our next area of focus. We are trying to determine whether more resident education is needed or whether a simple intervention such as changing the color of the forms will encourage their increased use. We will also be requesting that the Ophthalmology Clinic document completed diabetic eye exams in the EHR.

**Women’s Health Clinic**

The next step will be to address variability in physician performance, which was dependent on staff turnover and the presence of supplemental

nursing staff, not catching patients at problem visits, and missed opportunities, given that the current registry does not include laboratory tests completed at non-VCU facilities.

**Family Medicine Clinic**

We will focus on increasing the use of a population nurse, a position created to coordinate care for patients who were identified by the QI program as needing more individualized diabetes self-management training, and a nutritionist to begin interventions in patients with an A1C >9%. We will also try to increase use of the Problem Areas in Diabetes scale, a validated tool to assess emotional functioning in diabetes (1), and referrals of patients identified for social work or psychological evaluations.

**Endocrinology Clinic**

The next step in this clinic will be to have diabetes educators continue to encourage patients to perform home data downloads and use of the patient portal. We will also be spreading the educational toolkit to the young adult and adolescent diabetes population to encourage earlier development of and lifelong engagement in diabetes self-management skills. We are also creating a diabetes registry using the EHR so the clinic can track the same

performance data now available to the other clinics.

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

An interdisciplinary team with strong leadership and organizational support is crucial in designing a QI program that is effective and ensures buy-in from all stakeholders involved in implementation. Additionally, dedicated time and resources are crucial to success; those of us with dedicated time and funding were able to participate in the work to a much greater extent than those without. Each clinic focused on a different area but then adopted best practices from the other clinics. An electronic registry will continue to be key to future improvements, as will the development and use of population health registered nurses.

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**Duality of Interest**

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

**Reference**

1. Welch GW, Jacobson AM, Polonsky WH. The Problem Areas in Diabetes scale: an evaluation of its clinic utility. *Diabetes Care* 1997;20:760–766