Novel Ideas and Team Approach to Improve Outpatient Diabetes Control in a Large Hospital System

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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 an initiative aimed at reducing the percentage of patients with an A1C >9% in outpatient settings within a large Pennsylvania health care system.

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Describe your practice setting and location.

UPMC Pinnacle is a nationally recognized leader in providing high-quality, patient-centered health care services in central Pennsylvania and surrounding rural communities. Its >2,900 physicians and allied health professionals and ~11,000 employees serve a 10-county area at outpatient facilities and eight acute care hospitals with 1,360 licensed beds: UPMC Carlisle, UPMC Community Osteopathic, UPMC Hanover, UPMC Harrisburg, UPMC Lancaster, UPMC Lititz, UPMC Memorial, and UPMC West Shore. The latter five hospitals were recently acquired. UPMC Pinnacle has a large group of employed primary care physicians (>175) with multiple sites. The not-for-profit system anticipates caring for more than 1.2 million area residents in FY 2018.

Describe the specific quality gap addressed through the initiative.

This program focused on reducing the percentage of patients who had an A1C >9% in outpatient settings.

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

The gap was identified through the system's electronic health record from diabetes registry data. Our diabetes registry comprises >17,000 patients with diabetes, including individuals with gestational diabetes and children, as well as adults with diabetes.

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

Twenty-five percent of patients with diabetes throughout all of our primary care sites had an A1C >9% at baseline. Patients with higher A1Cs (>9%) had 30% more Emergency Department visits for the 2014–2015 year. Data collected for readmission rates in patients with diabetes were directly proportional to higher A1C.

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

At the time of writing, the program had been operating for 18 months and is ongoing.

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

The endocrinologist who is the medical director of Endocrinology at UPMC Pinnacle and also the chairman for Diabetes Clinical Initiative, the quality project for inpatient diabetes control, serves as the project leader. This physician has led the inpatient glycemic control program to improve glucose control across the entire institution for the past 10 years. The institution was recognized by the Joint Commission as a Center of Diabetes Excellence in 2009 (the first Joint Commission-recognized center in Pennsylvania). The remainder of the team consists of nutritionists, diabetes educators, medical assistants (MAs), office managers, a population health nurse, information technology personnel, and a specialty-trained diabetes nurse practitioner (NP).

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

We made the following structural changes through this initiative.

1. We provided both diabetes and nutrition education support at primary care office sites to improve access to patients. Resources were used to hire more educators. We have an American Diabetes Association (ADA)-recognized diabetes education program. Two extra educators were hired and located in different PCPs' offices. The educators were certified diabetes educators and were trained for intensive diabetes management by the endocrinologist.
2. We hired a diabetes NP to provide diabetes care at the five most populated sites. The NP was trained by the endocrinologist to provide care for difficult and complicated patients. She provided interim care along with the physician by following patients every 4–6 weeks. The NP had a panel size of 1,600 patients. She mainly focused on improving glycemic control (A1C) and intensifying the diabetes regimen but also addressed gaps for other targets such as blood pressure, lipid control, and nephropathy and ophthalmopathy screenings.
3. A nurse with specific experience in population health management was hired to help with noncompliant patients. Noncompliant patients were identified from the EHR if they did not show up for three consecutive scheduled visits with the NP and/or physician. The nurse made three phone calls and then sent letters to contact these patients. Barriers to noncompliance were identified and specific plans were discussed. Many of the barriers were related to finances and transportation, and these were addressed with the help of a social worker.
4. Flyers were designed and placed in each clinic room identifying and explaining the concept of team management for diabetes (Supplementary Figure S1).

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

We made the following process changes through this initiative.

1. We provided education on diabetes management to PCPs via lectures, printed handbooks, and best-practice Internet links. The endocrinologist conducted educational programs. A pocket booklet was designed and distributed to all providers. The booklet contained ADA guidelines for blood glucose control, including timelines for intensification of treatment for diabetes (Supplementary Appendix).
2. We empowered MAs to provide initial diabetes education and to download patients' glucose meters in our offices.
3. The endocrinologist led case discussions every 2–3 months at each site. Each month, office managers created a list of patients with an A1C >9%. The list was made available to all providers, and selected cases from the list were discussed with the endocrinologist. The providers were also encouraged to discuss cases via Web links, email messages, and messages in the EHR. The single endocrinologist was compensated for 20–25 % of her time to develop the whole program. The administration team for the hospital provided the compensation.

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

In the relatively short timeframe of 18 months, including installation of the new EHR (EPIC), highly encouraging results were accomplished, including:

- At baseline, 2,500 patients with diabetes were identified as having an A1C >9%; that number decreased to 1,460 patients after 18 months. The overall "A1C >9%" rate improved from 25 to 20.9% among the patients with diabetes across all sites. For non-Medicaid patients, there was a greater decrease, from 25 to 12.62% (Supplementary Figure S2). This result occurred despite the acquisition of many new practices in the 18-month interim. Such improvement was identified at all sites. Improvement was also found in the Medicaid population, although not to the same extent as non-Medicaid patients (from 35 to 21.8%) (Supplementary Figure S3).
- Diabetes education referrals increased by more than 100 patients in 1 year. These referrals were primarily at the office sites because of the more active presence of educators at PCPs' sites,

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but some of the referrals were centralized, as well.
- Along with A1C, other measures for the diabetes control program such as eye exams and microalbumin-to-creatinine ratio also improved as patients became more engaged.
- The population health nurse was instrumental in engaging noncompliant patients. The frequent calls made to these patients to gain an understanding of and address their barriers was the most effective tool. Thirty percent of these patients achieved engagement, as defined by attending their scheduled appointments with their PCP or NP.

Following are sample PCP testimonies regarding the program.

"I wanted to show you the improvement in percent of diabetic patients with hemoglobin A1C of <8[%]. As you can see, since you first talked to us about how to improve management of our [diabetes] patients in March, our percent has improved from 76.8% to 85.5%! The fact that the curve clearly starts to go up in March indicates to me that your education has been a major benefit."

"We all like [the] NP and the program very well. There are few patients who are noncompliant and that is different issues. But this program is working well for us and our patients also like it a lot."

"The program is very beneficial. It has helped guide my [patient] plans and strengthened my knowledge for [diabetes] treatment. Please keep it going. I look forward to the meetings and am grateful that you are there to answer my questions."

What are your next steps?

We have now started to measure the impact of the program on readmissions and Emergency Department visits. We have also started to replicate the program at our five newly acquired hospitals.

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

It is the team effort that succeeded. It was crucial to listen to PCPs' challenges and barriers and help them overcome those barriers. The endocrinologist-led diabetes discussions, the presence of a diabetes NP to manage difficult patients, and help from a population health nurse were the most useful tools identified by the providers.

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