New York Presbyterian–Brooklyn Methodist Hospital's Quality Improvement Project Targeting High A1C Levels

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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 Brooklyn, NY, hospital's initiative to reduce high A1C rates among its patients.

Describe your practice setting and location.

New York Presbyterian (NYP)-Brooklyn Methodist Hospital is located in Park Slope, Brooklyn, NY, and serves a population of ∼2.58 million people. It is one of the 12 NYP hospitals, and its Internal Medicine resident-run clinic provides primary care to the community. Of the resident-run clinic's patient population, 13.5% have been diagnosed with type 2 diabetes.

Describe the specific quality gap addressed through the initiative.

This project focused on using a multidisciplinary approach to reduce the percentage of clinic patients who had an A1C ≥9%.

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

In 2019, the NYP Initiative Committee established a goal to decrease the percentage of patients with diabetes with an A1C ≥9%. The quality gap was identified using the hospital's electronic medical record (EMR) system (Cerner, which later transitioned to Epic in December 2021), using patient data from 1 February 2018 to 1 February 2019. Across all four regions of NYP medical groups, we found a total of 17,532 patients with type 2 diabetes. At this point, we realized that a major quality gap existed in our own clinic practice at NYP-Brooklyn Methodist Hospital. We needed to create a more streamlined approach to managing our patients' diabetes.

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

For our quality improvement (QI) project, we solely used patient data at NYP-Brooklyn Methodist's Internal Medicine clinic. Of the 831 patients diagnosed with diabetes, 182 (22%) had an A1C ≥9%. These 182 patients had a mean A1C of 11%. A1C levels were distributed as follows: 67 patients had an A1C between 9 and 10%, 50 had an A1C of 10–11%, 29 had an A1C of 11–12%, and 36 patients had an A1C >12%. Of the total 182 patients, 63% were female, 56% were African American, 29% were Caucasian, 13% were Hispanic, 1% were Asian, and 1% declined to state their race/ethnicity.

Of the 182 patients, 54 did not participate in the intervention or were not included in the QI initiative. The 54 who were not included had an average A1C of 11.2%.

Of these patients, 64.8% were African American, 27.8% were Caucasian, and 7.4% did not disclose their race/ethnicity. These patients were lost to follow-up.

When compared with the patients who did not participate in the initiative, the 128 patients who did participate had an average A1C of 10.6%. Their A1C values were distributed as follows: 43 patients had an A1C of 8–10%, 62 had an A1C of 10–12%, and 23 had an A1C >12%. Of these 128 participating patients, 52.3% were African American, 28.9% were Caucasian, and 18.8% declined to disclose their race/ethnicity.

What was the time frame from initiation of your QI initiative to its completion?

This is an ongoing project that began in 2019 with an initial goal of achieving an absolute risk reduction of 5% in the number of patients with an A1C ≥9% by 2021.

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

Our QI team was led by the two co-chiefs of the outpatient resident-run clinic, along with two Internal Medicine residents and two medical students who collected and interpreted the data. Patients were screened by all Internal Medicine residents who worked in the clinic beginning in 2019; attending physicians supervised these residents and discussed and confirmed their patients' care plans. The patients who fulfilled inclusion criteria were referred to the Endocrinology Department.

Other team members included medical assistants, nutritionists, pharmacists, social workers, and administrative staff. Additionally, at the beginning of the project, a community health worker (CHW) program was initiated to provide a support system for clinic patients. These CHWs provided appointment assistance, telehealth connection, access to local resources (e.g., helping to find affordable supermarkets), and social support if needed. This service may have played an integral role in our project; however, at the time of data analysis, we did not have enough documented information to determine whether it affected the final outcome. This issue is further elaborated on below, in the question about next steps.

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

We created a streamlined approach to build a foundation for managing patients with uncontrolled diabetes in the outpatient setting within our Internal Medicine residency program. We created a Physician's Standard of Care Pocket Guide in line with American Diabetes Association (ADA) guidelines and distributed it to Internal Medicine residents. These pamphlets were also pinned to the workboards above each computer in the documentation rooms of the resident-run clinic and left in each examination room, and a digital copy was uploaded to the residents' informational website for easy access from a mobile device at any time. The residents were all made aware of this initiative on the first day of their clinic block of the academic year.

The pocket guide included a table to help our colleagues impart to their patients a clear understanding of their plan of care, including with whom they should schedule follow-up appointments. The guide also covered when medication intensification was appropriate and when patients should expect to get their next set of laboratory tests. Supplementary Figure S1 shows the first table we created to serve as a care plan algorithm for the residents. Attached inside the pocket guide were figures summarizing the ADA's overall approach to glucose-lowering medications. The guide was created to address the current reality of tremendous variation in adherence to the ADA's standards of care among residents and allow us to reduce that variation and bring resident-provided care more consistently in line with current ADA recommendations.

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

All patients with an A1C >9% were informed that they were eligible for monthly in-person appointments until their A1C was <9%. To establish care, patients were first seen in person. During these initial visits, a treatment goal to achieve an A1C <9% was established and medication reconciliation occurred. Patients were scheduled for a follow-up telemedicine appointment 2 weeks later with our diabetes management team members. Whether patients were then seen in person or via telemedicine for monthly follow-up was determined on a case-by-case basis during the initial visit based on factors such as patients' access to the clinic and work schedules.

During follow-up appointments, we assessed patients' progress toward their treatment goal of attaining an A1C <9% and medication compliance, discussed any medication side effects they were experiencing, and reviewed their daily fasting blood glucose levels. Based on this information, we adjusted their medications as needed. We also had the option to consult additional members of our

interdisciplinary team during these visits, including our endocrinologists, in-house pharmacists (particularly for patients taking more than five medications with or without insulin), diabetes educator, and/or social worker. Telemedicine visits were an integral part to our success and will remain an integral part of our practice's approach to maintaining strong follow-up with patients.

As seen in Supplementary Figure S2, patients with an A1C ≥9% were referred to the CHW program through the messaging application in the EMR system. The CHWs assisted patients via telephone with scheduling appointments, accessing local resources, and connecting for telemedicine visits. We referred patients to pharmacists if they were taking five or more prescribed medications, including non–glucose-lowering medications. The pharmacists called patients and provided education about their various medications, why these drugs were important to their care, how to take them safely, and what possible side effects they may experience. Once pharmacists interacted with a patient, they would leave a note in the EMR system that was forwarded to the resident primarily responsible for that patient's care.

Within the intervention group, all patients with an A1C >9% were referred to the Endocrinology Department. This department played an integral role in helping those who required a more complex regimen such as those who needed concentrated insulin and those using an insulin pump, which was beyond the scope of resident-provided care.

We also created a self-care guide booklet for our patients. Residents gave this booklet to all intervention group patients during their initial visit. The residents were expected to review the booklet with their patients. Among the topics covered were complications of diabetes, healthy meal planning, and signs and symptoms of hypoglycemia and hyperglycemia. This booklet was a reference patients could continue using after they left the clinic to aid in their diabetes management.

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

Of the 182 patients who met our inclusion criteria, 128 underwent intervention, of whom 41 patients (32%) have so far achieved an A1C of <9% between February 2019 and December 2021. Of the 128 who underwent intervention, all were referred to the Endocrinology Department; however, only 74 patients (57.8%) were documented as having attended an initial

endocrinology appointment. Furthermore, 32 (25%) were documented as having seen a pharmacist, and 9 (7%) had an appointment with a nutritionist. Thirteen of the 32 patients who saw a pharmacist (40.6%) and three of the nine who saw a nutritionist (33.3%) achieved an A1C <9%. All patients were offered pharmacy and nutrition services per protocol, but many declined because of factors such as difficulty attending multiple appointments.

The 54 patients who were not included in the study were lost to follow-up. Per documentation in the EMR, they received education on the importance of glycemic control and were referred to other disciplines as outlined in Supplementary Figure S1. However, these individuals did not attend those appointments.

At the end of this data collection period, including both individuals who received the intervention and those who were lost to follow-up, 16.9% of clinic patients with diabetes had an A1C ≥9%. Excluding those lost to follow-up, 11.2% of our patients with diabetes continued to have an A1C >9%.

What are your next steps?

Our project has shown us the importance and efficacy of taking a multidisciplinary approach to managing diabetes. We believe that our protocol is a sustainable and easy model for other outpatient clinics to adopt. The residency clinic will work with the organizational Information Technology Department leadership to further optimize the EMR system by developing tools and tactics such as dot phrases and pop-up tabs to aid in diabetes care. These pop-up tabs will appear as alerts on the front page of patients' charts, similar to the way age-appropriate screening alerts appear, to prompt providers to order needed laboratory blood tests.

Analysis of the impact of our CHW program was beyond the scope of this article. Evolution of the program will include placement of CHWs directly in the clinic to perform real-time assessments of patients' needs to accelerate the provision of support. The impact of this revamped CHW role will be included in subsequent analyses.

Moving forward, we intend to focus on improving patient participation and looking into social determinants of health and how they might affect outcomes. One goal is to better understand why the 54 patients who were lost to follow-up did not participate in our project and how we can decrease the number of nonparticipants moving forward.

It should be noted that most of the data collection and intervention implementation in this project occurred right before the start of or during the coronavirus disease 2019 (COVID-19) pandemic. This timing likely affected the number of patients who were included in the study because the number of patients having in-person visits to medical facilities decreased during the pandemic as a result of several factors such as social distancing guidelines and anxiety regarding being in close proximity to others. As the pandemic continues to subside and patients are more inclined to start seeing their providers again, we will compare post-pandemic patient outcomes to data from our initial intervention.

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

The most important lesson we learned is that standardizing protocols and processes leads to improvement in patient care. A model through which patients are engaged and play a central role in their management is key. With the majority of our data collection occurring during the COVID-19 pandemic, we learned that the use of telehealth helped to maintain follow-up.

Originally, we thought team-based care would be the most influential factor in reducing A1C; however, during data analysis, we found that only a small number of our patients followed up with their interdisciplinary team member appointments. Consolidation of appointments may help to increase rates of engagement with these aspects of care.

We hope that the success we have experienced so far in our QI initiative can help to guide other clinics and practitioners in their approach to improving the quality of care for their patients with diabetes.

DUALITY OF INTEREST

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

AUTHOR CONTRIBUTIONS

S.Z. and J.V. wrote the manuscript and interpreted the data. N.M.T. and T.T.T. collected data from the EMR system. A.L. and D.C. helped to gather the project team, contributed to discussion, and reviewed/edited the manuscript. S.Z. and J.V. are the guarantors of this work and, as such, had full access to all the data in the study and takes responsibility for the integrity of the data and the accuracy of the data analysis.