Effect of a Type 2 Diabetes–Focused Visit Improvement Initiative on Therapeutic Inertia and Glycemic Control in Primary Care

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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 multicomponent quality improvement initiative in the Chicago, IL, area that used a diabetes-focused clinic visit to overcome barriers that lead to clinical inertia for type 2 diabetes.

Describe your practice setting and location.

This quality improvement (QI) project was conducted in the Department of Family Medicine at NorthShore University HealthSystem, an integrated health system in the Chicago, IL, area with 13 ambulatory family medicine primary care practices caring for ∼5,000 adult patients with type 1 or type 2 diabetes.

Describe the specific quality gap addressed through the initiative.

Despite innovations in treatment, ∼50% of people with type 2 diabetes in the United States have not achieved the generally recommended A1C target of <7.0% (1). Patients with poorer glycemic control are at higher risk of emergency room utilization and hospitalization, as well as long-term complications, including chronic kidney disease, cardiovascular disease, and heart failure (2). Historically marginalized groups and people experiencing lower socioeconomic status are more likely to experience diabetes and its complications (3). Therapeutic inertia, or a lack of timely treatment adjustment when needed to reach glycemic and other diabetes management targets, has been identified as a key driver of poor glycemic control (4,5). However, endocrinology specialty services are in short supply, and patients may experience further delays in intensification of therapy if primary care clinicians are unable to intensify treatment because of a lack of knowledge or experience with newer oral antihyperglycemic agents (6,7). The American Diabetes Association (ADA) recommends system-level improvements such as team-based care and reorganization of the care process to address health system limitations such as fragmentation and duplication of care that create variability in the quality of care among populations with type 2 diabetes (8,9).

Therefore, we implemented a multicomponent quality intervention centered on the design of a diabetes-focused visit (DFV) to address barriers that lead to clinical inertia. Our primary outcomes were *1*) change in the percentage of adult patients with type 2 diabetes with poor glycemic control (indicated by the percentage of people with an

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A1C ≤9%) and *2*) change in the rate of retinopathy screening. Secondary measures included change in the number of patients on monotherapy (only one antihyperglycemic agent) and the impact of the intervention on utilization of primary care and certified diabetes care and education specialist (CDCES) services for type 2 diabetes.

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

NorthShore University HealthSystem's Diabetes Quality Committee is charged with improving ambulatory diabetes care and performance on quality metrics, including glycemic control, screening for diabetic kidney disease, and screening for retinopathy. The committee reports to the ambulatory chief quality and transformation officer and includes quality and transformation managers, administrative leaders, informaticists, and multidisciplinary content experts representing endocrinology, primary care, pharmacy, and diabetes education. NorthShore uses the Healthcare Effectiveness Data and Information Set (HEDIS) definition, or percentage of patients 18–75 years of age with type 1 or type 2 diabetes with A1C ≤9%, to track and report glycemic control. At baseline, NorthShore's overall rate of poor control (A1C >9%) was 20.7% (3,610 of 17,449 patients). We noted significant disparities in our quality metric for glycemic control among primary care practices in different communities.

We analyzed electronic medical record (EMR) data for 4,927 adults with type 1 or type 2 diabetes empaneled to family medicine practices to identify factors associated with poor glycemic control and found that patients with poor control were more likely to live in an area affected by social disadvantage as measured by the social deprivation index (10). They had an average of 3 primary care visits (interquartile range [IQR] 2–6) compared with 5 visits (IQR 3–7) for patients with an A1C ≤9%. They were less likely to have had an A1C test in the previous year (56%) compared with 100% in those with an A1C ≤9%. We then performed stakeholder interviews with patients, physicians, and other health care team members to identify systems-level barriers to glycemic control and change ideas for a QI intervention.

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

The pilot site was a family medicine practice with eight physicians and two advanced practice providers located in Gurnee, IL, a community with a high level of health inequity as measured by the community need index (11). At baseline, 28% of adult patients with type 2 diabetes (411 or 1,484) at the pilot site had poor glycemic control, which was 40% higher than the system average.

The pilot intervention inclusion criteria were adults with type 2 diabetes, a most recent A1C result of 9.0–10.1%, a visit with a clinician at the practice within the past 12 months, and no visit with an endocrinologist in the past 12 months. These pragmatic inclusion criteria were chosen consistent with the organization's HEDIS measure to identify patients who could likely achieve an A1C of <9% in a primary care setting without increasing referrals to endocrinology. Of the 411 patients with poor glycemic control, 82 adults met these inclusion criteria. The average most recent A1C for this group was 9.5%. Additional baseline demographic data are shown in Supplementary Table S1.

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

The QI initiative was launched at the pilot site in May 2019. Data collection was completed in May 2020.

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

The NorthShore Diabetes Quality Improvement Committee team developed and implemented this project. The vice chair for quality for the Department of Family Medicine, a physician with extensive QI training, led the project with the assistance of two quality and transformation managers who provided QI expertise, organization and implementation, and data analytics support. A clinical pharmacist and an endocrinologist provided content expertise. The team also included administrative champions (the pilot site practice manager and lead physician) and a clinical champion (a physician assistant employed at the pilot site with interest in type 2 diabetes). This initiative was developed as part of the team's participation in the Institute for Healthcare Improvement (IHI) Medication Optimization in Primary Care Learning and Action Network, a 12-month, rapid-action collaborative including seven health care organizations working on QI initiatives on medication optimization, with education and coaching support from IHI (12).

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

We created a DFV to address the system- and clinician-level barriers leading to therapeutic inertia as drivers of

poor glycemic control (Supplementary Figure S1). The DFV was a scheduled visit with a single agenda of diabetes care, incorporating several change ideas identified in our driver diagram. These ideas included:

- Outreach calls for visit scheduling
- Pharmacist pre-visit planning chart review and medication recommendations
- Point-of-care (POC) A1C testing
- Clinician visit with treatment recommendations
- CDCES visit with abbreviated, focused education
- Enhanced checkout process with scheduling of retinopathy screening, primary care, and CDCES follow-up appointments
- Pharmacist assistance on demand for prescription coverage and affordability barriers

Our health system did not routinely use POC A1C testing, and lack of a recent A1C test result was identified as a driver of therapeutic inertia. Therefore, we added POC A1C testing to the rooming process for the DFV.

Patients in our stakeholder interviews reported time, financial, and opportunity cost barriers to scheduling additional CDCES visits, so we included an abbreviated, same-day CDCES visit to the DFV to initiate diabetes education.

Many primary care clinicians in the health system were unfamiliar with newer medications, including sodium–glucose cotransporter 2 (SGLT2) inhibitors and glucagon-like peptide 1 (GLP-1) receptor agonists in 2019, and our health system did not have collaborative practice agreements for pharmacists in primary care practices. The QI team pharmacist performed pre-visit planning medication reviews and sent in-basket messages to clinicians scheduled to see these patients with suggestions such as increasing a patient's metformin dose or adding a new medication. Patients were instructed to contact the office after their DFV if they experienced coverage or cost barriers to obtaining medications, and the QI team pharmacist addressed these barriers through additional phone calls.

We also developed a manual data registry for patients who met the inclusion criteria for our QI project and used the registry to track outreach, visit completion, and outcomes.

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

Several aspects of the DFV targeted the process of care. Although our health system already used automated outreach calls and standing A1C orders, we added personalized outreach calls from the pilot site. Stakeholder interviews also identified challenges in the call center and difficulties with access for follow-up appointments. Therefore, we added an enhanced checkout process to overcome barriers to scheduling retinopathy appointments and follow-up appointments with clinicians and CDCESs.

We developed a one-page simplified version of the algorithm for pharmacologic treatment of type 2 diabetes from the ADA's *Standards of Medical Care in Diabetes—2019* to address clinician education regarding therapeutic inertia and newer medications (Supplementary Figure S2) (13). An endocrinologist content expert provided education for the eight physicians and two advanced practice providers regarding pharmacologic approaches to glycemic treatment, how to use the one-page algorithm in practice, and how to address common barriers leading to therapeutic inertia.

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

Of the 411 patients with poor glycemic control, 82 met our inclusion criteria. At baseline, the average A1C for these 82 patients was 9.5% (range 9.0–10.1%). All 82 patients were offered a DFV, and 35 (43%) accepted a DFV appointment, whereas 47 (52%) declined or did not respond to outreach and received usual care.

Of the 35 patients scheduling a DFV, the average POC A1C on the day of the DFV was 9.2%. A total of 29 of the 35 patients participating in a DFV followed up for a repeat A1C by the end of the initiative, with an average A1C of 8.5% and average improvement of −0.9%. Thirty-five of the 47 patients receiving usual care followed up for a repeat A1C by the end of the initiative, with an average A1C of 9.6% and average change in A1C of +0.1%.

By the end of the improvement initiative, 38 of 82 patients (46%) achieved the primary outcome of an A1C ≤9%, including 24 of the patients who participated in the DFV (69%) and 14 of the patients who received usual care (30%). Retinopathy screening rates were similar before and after the initiative. Regarding secondary measures, there was no reduction in the number of patients taking diabetes monotherapy, but more patients were prescribed a GLP-1 receptor agonist in both the group participating in the DFV, from 1 (3%) to 12 (24%), and the group receiving usual care, from 2 (4%) to 9 (19%). The majority

of patients who added a GLP-1 receptor agonist had a medication discontinued at the same time, most commonly a dipeptidyl peptidase 4 inhibitor or a sulfonylurea. Patients who engaged in a DFV averaged 2.9 primary care visits for diabetes and 1.1 CDCES visits during the study period. Some participants ($n = 7$) did not receive the abbreviated CDCES visit at their DFV because of scheduling concerns (e.g., a patient had to leave for another appointment) (Supplementary Table S2).

What are your next steps?

In fall 2019, we expanded the DFV to two additional family medicine offices, with the exception of the pharmacist pre-visit planning chart review component. The coronavirus disease 2019 (COVID-19) pandemic interrupted follow-up care and retinopathy screening appointments and reduced resources available to expand this pilot to other clinical practice sites. As we rebuild from COVID-19, we will continue to explore how to leverage pharmacist resources efficiently among a larger population using automated EMR processes.

Because this QI initiative was not a randomized trial, some of the improvement noted for patients participating in the DFV may have been a result of selection bias. Future studies should evaluate the DFV model with a randomized design.

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

Our QI journey started with preliminary data that showed multiple barriers within our health system leading to therapeutic inertia, patient dissatisfaction, and fragmented diabetes care. For example, patients completed a laboratory visit in advance of a primary care visit and additional CDCES and retinopathy screening visits, requiring multiple phone calls to schedule during regular business hours. Our preliminary stakeholder interviews suggested that each of these steps placed burden on patients. Throughout this QI project, we focused on reorganizing the care process to improve patient engagement and the patient experience.

The DFV intervention resulted in improved glycemic control compared with usual care. This result is partially explained by more frequent A1C checks, as nine patients (25%) had a POC A1C <8% on the day of their DFV. Rechecking the A1C for patients who are near the organizational quality metric goal is an important strategy to consider, as this simple intervention may have demonstrable impact on overall quality metrics.

The improvement in glycemic control could also be explained by the increased utilization of GLP-1 receptor agonists, diabetes education, and primary care services, as there was a statistically significant difference between groups in the number of primary care and CDCES visits (Supplementary Table S2). We found that leveraging a pharmacist as a consultant was an effective way to increase utilization of GLP-1 receptor agonists and SGLT2 inhibitors for primary care clinicians who had less experience with newer medications without increasing referrals to endocrinology, a limited resource in our system with long wait times. This is the first QI intervention that we are aware of that demonstrates increased utilization of GLP-1 receptor agonists in primary care.

Having strong clinical and administrative quality champions at the practice and experienced QI managers and support from the chief quality and transformation officer further strengthened the success of this pilot and its future sustainability.

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DUALITY OF INTEREST

L.O. reports stock holdings in Abbvie, Abbott, Johnson & Johnson, and Merck that are unrelated to this study. L.K.B. has received personal fees from Bayer, Dexcom, Lilly, Novo Nordisk, and Sanofi that are unrelated to this study. No other potential conflicts of interest relevant to this article were reported.

AUTHOR CONTRIBUTIONS

L.O. and M.B. served on the NorthShore Diabetes Quality Improvement Committee and contributed to the conception and design of the work. F.C. and R.N. collected and analyzed data.

M.R. performed a literature review. L.O., M.B., and L.K.B. contributed to the interpretation of data. L.O. drafted the manuscript. M.B. and L.K.B. reviewed, edited, and provided critical revision of the manuscript. L.O. is the guarantor of this work and, as such, had full access to all of the data and takes responsibility for the integrity of data and the accuracy of the article.

REFERENCES

1. Centers for Disease Control and Prevention. *National Diabetes Statistics Report 2020: Estimates of Diabetes and Its Burden in the United States*. Available from https://www.cdc.gov/diabetes/pdfs/data/statistics/national-diabetes-statistics-report.pdf. Accessed 10 June 20221

2. American Diabetes Association. 4. Comprehensive medical evaluation and assessment of comorbidities: *Standards of Medical Care in Diabetes—2021*. Diabetes Care 2021;44(Suppl. 1):S40–S52

3. Ogunwole SM, Golden SH. Social determinants of health and structural inequities: root causes of diabetes disparities. Diabetes Care 2021;44:11–13

4. Gabbay RA, Kendall D, Beebe C, et al. Addressing therapeutic inertia in 2020 and beyond: a 3-year initiative of the American Diabetes Association. Clin Diabetes 2020;38:371–381

5. Andreozzi F, Candido R, Corrao S, et al. Clinical inertia is the enemy of therapeutic success in the management of diabetes and its complications: a narrative literature review. Diabetol Metab Syndr 2020;12:52

6. Romeo GR, Hirsch IB, Lash RW, Gabbay RA. Trends in the endocrinology fellowship recruitment: reasons for concern and possible interventions. J Clin Endocrinol Metab 2020;105:1701–1706

7. Gao Y, Peterson E, Pagidipati N. Barriers to prescribing glucose-lowering therapies with cardiometabolic benefits. Am Heart J 2020;224:47–53

8. American Diabetes Association Professional Practice Committee. 1. Improving care and promoting health in populations: *Standards of Medical Care in Diabetes—2022*. Diabetes Care 2022;45(Suppl. 1):S8–S16

9. Rushforth B, McCrorie C, Glidewell L, Midgley E, Foy R. Barriers to effective management of type 2 diabetes in primary care: qualitative systematic review. Br J Gen Pract 2016;66:e114–e127

10. Butler DC, Petterson S, Phillips RL, Bazemore AW. Measures of social deprivation that predict health care access and need within a rational area of primary care service delivery. Health Serv Res 2013;48:539–559

11. Roth R, Barsi E. The community need index: a new tool pinpoints health care disparities in communities throughout the nation. Health Prog 2005;86:32–38

12. Baehrend J. From song to symphony: managing medication optimization. Available from https://www.ihi.org/communities/blogs/from-song-to-symphony-managing-medication-optimization. Accessed 24 January 2022

13. American Diabetes Association. 9. Pharmacologic approaches to glycemic treatment: *Standards of Medical Care in Diabetes—2019*. Diabetes Care 2019;42(Suppl. 1):S90–S102