



Optimizing Glucose Meter Downloads at Parkland Diabetes Clinic

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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 project aimed at increasing the number of patients who bring their glucose meters to their appointments for downloading at a diabetes specialty clinic with a diverse patient population in Dallas, TX.

Describe your practice setting and location.

This project took place at the Diabetes & Foot Wound (DFW) Clinic of the Parkland Health & Hospital System, the public health system serving residents of Dallas County, TX. Both foot wound and diabetes specialty services are located in the clinical space. The diabetes clinic serves as the specialty training site for endocrine fellows on 1 half-day per week and is staffed by advanced practice providers 5 days per week. One to three attending physicians oversee clinical activities, and one to three advanced practice care providers see patients on a daily basis. The staff also comprises two registered nurses, three licensed vocational nurses, two medical assistants, three clerical staff members, one social worker, and one unit

manager. The clinic is also supported by a dietitian and a nurse who is a certified diabetes care and education specialist.

The clinic has roughly 500 patient and provider encounters per month. Patients attending the clinic comprise an ethnically diverse (50% Hispanic/Latinos, 30% Black, and 15% non-Hispanic White) and socioeconomically underserved (50% receive charity care and <10% have commercial insurance) population.

The DFW Clinic is a tertiary referral site that accepts patients with type 1 diabetes, patients with advanced complications or complex disease, and patients with uncontrolled type 2 diabetes despite being prescribed insulin therapy. More than 95% of individuals seen by the diabetes specialists are on insulin therapy.

Describe the specific quality gap addressed through the initiative.

Review of blood glucose data are essential to understand how to adjust treatment for hyperglycemia, especially in patients who are on more complex insulin regimens. However, not all patients attending the clinic bring their glucose meters to their appointments, considerably limiting the ability of the health care team to make informed recommendations for changes or adjustments to their diabetes therapy.

The aim of this quality improvement (QI) project was to increase the number of patients who bring their glucose meters to their clinic appointments. Data from meters that are brought in are uploaded to a Glooko software platform residing in the clinic, and that information is made available at the point of care to health care professionals for review and discussion with patients. We sought to increase the number of glucose meters downloaded into Glooko from a baseline of slightly >50% (as of June 2019) to a target of 60% by May 2020. The rationale for choosing this goal was to balance a substantial and meaningful improvement in the activity against the limited time frame

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available for this project. It is believed that real improvement requires an element of cultural change to encourage patients' habits and outcomes to change over time.

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

The Glooko downloading platform was implemented in the first half of 2018 to facilitate access to essential blood glucose data for health care professionals in the DFW Clinic. We put in place a tracking program in collaboration with the Glooko support team to allow us to calculate the number of monthly glucose meter downloads (Supplementary Figure 1). We then identified the gap in quality by assessing on a monthly basis the percentage of patients who have their glucose meters downloaded during their appointment.

Provider and patient surveys were created to assess current perceptions within the DFW Clinic regarding self-monitoring of blood glucose (SMBG) (Supplementary Figure 2). A convenience sample was used, as patients were interviewed in the waiting room of the DFW Clinic Parkland Diabetes Clinic before their appointment. Surveys were available in both English and Spanish. Only patients who reported being in the clinic for a diabetes appointment and not foot wound appointment were surveyed.

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

Fifty-one patient surveys were collected over 2 weeks. Two surveys were excluded because the patients did not answer the question, "Did you bring your glucose meter to your appointment today?," leaving a total of 49 survey respondents. Forty-five percent of the patients surveyed responded that they brought their meter to their appointment, compared with the clinic average of 53%. When asked about reminders to bring in their glucose meters, 37% of the patients reported being reminded to bring their meter, with almost all recalling being told to do so verbally. Of those who remembered being told to bring their meter, 72% brought it to their appointment.

According to the staff/provider surveys, all patients were reminded to bring their glucose meter by various methods, including verbal reminders before their appointment and in print on the after-visit summary provided after each clinic visit. When asked about reasons for not bringing their glucose meters to their appointment, the most common responses from patients were that they simply forgot or that they did not know they needed to

bring it. We created an intervention to address both of these factors.

At baseline, 53.3% of clinic patients were bringing a glucose meter to clinic appointments to be downloaded into the Glooko platform. This proportion is derived from the average number of patients who brought a glucose meter to be downloaded divided by the number of patients who attended an appointment at the DFW Clinic with a provider between the months of June 2018 and June 2019. May 2018 was the first month the Glooko program was instituted, so that month was not included in the final analysis in case including it could have artificially lowered the baseline percentage.

The clinical value of SMBG in type 2 diabetes remains controversial, with some studies finding that there may be little to no difference in patient outcomes, including mortality, patient satisfaction, or quality of life (1). However, these findings are likely related to the fact that patients might not be given appropriate instructions for managing glycemia, or possibly they may not consistently follow provider recommendations. A1C and SMBG are still considered the gold standards for assessing diabetes outcomes because they have been associated with improved glucose control and decreased risk of complications (2). Another recent study found that SMBG only had an effect on reducing A1C when combined with regular, frequent communication of SMBG data with a health care provider (3).

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

This project began during the summer of 2019. At that time, we determined a potential gap in quality at the DFW Clinic with regard to the proportion of patients who bring their glucose meters to their appointments. We then went back to collect and analyze baseline data from June 2018 through June 2019. We created surveys and distributed them throughout June 2019.

The data gathered from these surveys led to the creation of our project intervention. The intervention lasted 8 months, from July 2019 through February 2020. We then analyzed the improvements resulting from the intervention from March through May 2020.

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

A second-year medical student undertook this QI project as part of her medical school distinction activities and

served as the project lead. She worked closely with two project mentors who are endocrinologists who oversee clinical operations, as well as the nursing and business staff of the DFW Clinic and the University of Texas Southwestern QI faculty and staff.

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

The survey results demonstrated a disconnect between the staff/providers and patients with regard to communication methods used and perceived. This finding led to our intervention. We created flyers in both English and Spanish to post in clinic exam rooms. These were meant to facilitate discussion of the importance of SMBG and the usefulness of bringing glucose meters to clinic appointments. Flyers were placed in work stations and exam rooms so they would be visible to patients while they awaited their provider and would serve as visual prompts to providers to either remind patients to bring their meters to clinic or provide positive reinforcement for those who did so.

A handout was distributed to clinic staff to inform them of the results of the project and to encourage them to continue open communication and dialogue with patients given the positive outcomes of this initiative.

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

We determined that increased verbal communication between patients and their provider/clinic staff was the most effective way to remind patients to bring their meters to the clinic, as well as to effect change in their perceptions of SMBG. A staff education session was conducted twice during the intervention period to share our survey findings.

We encouraged staff and providers to continuously verbally remind patients at every opportunity to bring their glucose meter to their appointment. An expectation was set to have every staff/patient interaction include mention of the importance of SMBG and a reminder about bringing the glucose meter to each clinic visit. This interaction took place at several touchpoints, including when the front desk staff called patients to schedule a clinic appointment, when the nursing staff put patients in an exam room during their clinic visit, and during the visit with the provider. Providers were expected to either encourage patients to bring their meter at the next visit if they had forgotten to do so at the current visit or give positive reinforcement if they had indeed brought their

meter to the visit. These various verbal touchpoints appeared to influence patients' beliefs regarding SMBG and the importance of bringing their meters to their clinic appointments.

If you used the “Plan, Do, Study, Act” (PDSA) change model, provide details for one example.

- **Plan:** We wrote patient survey questions and got the surveys approved and translated into both English and Spanish.
- **Do:** We used a convenience sample by interviewing patients while they waited for their clinic appointment.
- **Study:** We analyzed survey responses and answered individual patients' questions.
- **Act:** We reworded some questions to more accurately assess patients' beliefs regarding SMBG and to ensure that they were at a more appropriate health literacy level.

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

The intervention lasted from July 2019 through February 2020, and data were collected on all patients (new or established) seen in the clinic for diabetes. Because the Glooko software was implemented beginning in May 2018, the data collected from that month were not included in the final analysis.

The monthly percentage of patients who brought glucose meters that were then uploaded to Glooko increased from the baseline of 53.3% (2,541 Glooko uploads over 4,767 patient visits with providers) to 57.76% (2,378 Glooko uploads over 4,117 patient visits with providers). This increase was statistically significant based on a χ^2 test with a probability of <0.0001 .

The original patient surveys demonstrated a substantial mismatch between patient and provider beliefs and expectations regarding SMBG utility and effectiveness in clinic appointments (Supplementary Figures S3 and S4). Providers pointed out that they reviewed and downloaded SMBG data on their computer screens without needing to look at data from meter memory, which may have been one reason for the discrepancy in perception. Providers and staff agreed that explaining to patients the processes of meter downloading and reviewing data on the computer screen would improve their perception of the value of SMBG and the importance of bringing their meter to the clinic. Verbal reminders to bring glucose meters to the

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clinic, along with an explanation of the value of doing so and processes involved in retrieving and reviewing data seemed to be the most effective approach.

Some stakeholders in the project, including clinic staff, mentioned that seeing the small flyers in the room reminded them to close each interaction with patients by reminding them to bring their glucose meter to their next appointment. The flyers also helped create a more open climate with increased dialogue between patients and their providers regarding the value of SMBG; this improved dialogue may have played a role in the increased proportion of patients who brought their glucose meters to their appointments during the intervention period.

The project was self-sustaining in that the flyers stayed posted in exam rooms and throughout the clinic to continue fostering discussion regarding SMBG.

What are your next steps?

The first iteration of the survey demonstrated that there was miscommunication between health care providers and patients regarding the importance of SMBG data in making appropriate treatment care decisions. Many patients did not think their provider reviewed their SMBG data or that these data had any bearing on treatment decisions. We would like to conduct a post-intervention survey to determine whether these perceptions and attitudes regarding SMBG have changed and to possibly use that information to develop a second intervention based on patient feedback.

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

A seemingly simple intervention such as creating awareness of the need to remind patients of the importance of bringing their glucose meters to their diabetes clinic appointment can make a significant difference in patient care if both providers/staff and patients are invested and involved in the process.

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DUALITY OF INTEREST

L.M. is a consultant to or advisory board member for Applied Therapeutics, Novo Nordisk, and Sanofi Aventis. No other potential conflicts of interest relevant to this article were reported.

AUTHOR CONTRIBUTIONS

I.W. created, distributed, and analyzed results of the patient and provider surveys; led the staff education sessions and created and posted flyers; and wrote and edited the manuscript. U.G. compiled data regarding patient visits during the pre-intervention and intervention periods for analysis and edited the manuscript. L.M. provided guidance and support, including coordination of approval for the project by Parkland Health & Hospital System and medical school administrators and assistance with the literature review for and writing of the manuscript. I.W. is the guarantor of this work and, as such, had full access to all the data in the project and takes responsibility for the integrity of the data and the accuracy of the data analysis.

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