ORIGINAL RESEARCH

Evaluating Pharmacists' Time Collecting Self-Monitoring Blood Glucose Data

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Background: Patients on intensive insulin regimens are encouraged to self-monitor blood glucose (SMBG) to optimize their therapy. Clinical pharmacist practitioners (CPPs) use SMBG data to adjust diabetes medications; however, collecting SMBG data from patients is seen anecdotally as time intensive.
Methods: CPPs involved in diabetes management on primary care teams at the Boise Veterans Affairs Medical Center in Idaho were asked to estimate and record the following: SMBG data collection method, time spent collecting data, extra time spent documenting or formatting SMBG readings, total patient visit time, and visit type. For total patient visit time, pharmacists were asked to estimate only time spent discussing diabetes care and collecting SMBG data. Data were collected for 1 week using a standardized spreadsheet distributed to 24 CPPs.
Results: Eight pharmacists provided data from 120 patient encounters. For all encounters, the mean time spent collecting SMBG data was 3.3 minutes, and completing additional documentation/formatting was 1.3 minutes for a total of 4.6 minutes. Patient visits lasted a mean 20.1 minutes; 16% was spent on data collection and 6% on documentation and formatting.
Conclusions: At the Boise Veterans Affairs Medical Center, CPPs spend relatively little time per patient collecting SMBG data for clinical use. However, this time can be substantial when multiplied over several patient encounters. Opportunities exist to increase efficiency in SMBG data collection and documentation.

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The American Diabetes Association recommends that patients on intensive insulin regimens self-monitor blood glucose (SMBG) to assist in therapy optimization.[1] To be useful, SMBG data must be captured by patients, shared with care teams, and used and interpreted by patients and practitioners.[2,3] Communication of SMBG data from the patient to practitioner can be challenging. Although technology can help in this process, limitations exist, such as manual data entry into systems, patient and/or practitioner technological challenges (eg, accessing interface), and compatibility and integration between SMBG devices and electronic health record (EHR) systems.[4]

The Boise Veterans Affairs Medical Center (BVAMC) in Idaho serves more than 100,000 veterans. It includes a main site, community-based outpatient clinics, and a clinical resource hub that provides telehealth services to veterans residing in rural neighboring states. The BVAMC pharmacy department provides both inpatient and outpatient services. At the BVAMC, clinical pharmacist practitioners (CPPs) are independent practitioners who support their care teams in comprehensive medication management and have the ability to initiate, modify, and discontinue drug therapy for referred patients.[5] A prominent role of CPPs in primary care teams is to manage patients with uncontrolled diabetes and intensive insulin regimens in which SMBG data are vital to therapy optimization. As collecting SMBG data from patients is seen anecdotally as time intensive, we determined the mean time spent by CPPs collecting patient SMBG data and its potential implications.

METHODS

Pharmacists at BVAMC were asked to estimate and record the following: SMBG data collection method, time spent collecting data, extra time spent documenting or formatting SMBG readings, total patient visit time, and visit type. Time was collected in minutes. Extra time spent documenting or formatting SMBG readings included any additional time formatting or entering data in the clinical note after talking to the patient; if this was done while multitasking and talking to the patient, it was not considered extra time. For total patient visit time, pharmacists were asked to estimate only time spent discussing diabetes care and collecting SMBG data. Visit types were categorized as in-person/face-to-face, telephone, and telehealth using clinical video telehealth (CVT)/VA Video Connect (VVC). Data were collected using a standardized spreadsheet. The spreadsheet was pilot tested by a CPP before distribution to all pharmacists.

CPPs were educated about the project in March 2021 and were asked to record data for a 1-week period between April 5, 2021, and April 30, 2021. One CPP also provided

TABLE 1 SMBG Data Collection Time

Data task	Data source, mean (SD), min						
	Patient report (n = 75)	Log/meter[a] (n = 19)	CGM (n = 15)	HT meter download (n = 9)	Secure EHR message (n = 2)	All (N = 120)	*P* value[b]
Collection	3.7 (2.6)	2.8 (1.8)	3.2 (3.0)	2.7 (1.6)	0.5 (0.7)	3.3 (2.5)	.07
Documentation/ formatting	1.4 (2.2)	0.7 (0.6)	0.9 (0.7)	2.0 (1.9)	1.5 (2.1)	1.3 (1.9)	–
Total visit time	18.5 (8.0)	6.8 (3.4)	44.3 (22.2)	23.4 (17.2)	10.5 (0.7)	20.1 (15.0)	–

Abbreviations: CGM, continuous glucose monitor; EHR, electronic health record; HT, home telehealth; SMBG, self-monitoring blood glucose.
[a]Patient provided SMBG data log or meter for data retrieval by the pharmacist.
[b]Compares patient report with all other methods.

delayed data collected from May 17 to 21, 2021, and these data were included in our analysis.

Descriptive statistics were used to determine the mean time spent by CPPs collecting SMBG data. Unpaired *t* tests were used to compare time spent collecting SMBG data by different collection methods and patient visit types. A *P* value of ≤ .05 was considered statistically significant. Data were organized in Microsoft Excel, and statistics were completed with JMP Pro v15.

RESULTS

Eight CPPs provided data from 120 patient encounters. For all patient encounter types, the mean time spent collecting SMBG data was 3.3 minutes, and completing additional documentation/formatting was 1.3 minutes (Table 1). Total mean time for SMBG collection and documentation was 4.6 minutes in visits that had a mean length of 20.1 minutes. Twenty-three percent of the visit was devoted to SMBG data, 16% for data collection, and 6% for documentation. In 23 encounters, at least half the time was spent collecting and documenting/formatting data.

When compared by the SMBG collection method, the longest time spent collecting SMBG data was with patient report (3.7 minutes), and the longest time spent documenting/formatting time was with meter download/home telehealth (2 minutes). There was no statistically significant difference in the time to collect SMBG data between patient report and other methods (3.7 minutes vs 2.8 minutes; *P* = .07).

When compared by visit type, there was not a statistically significant difference between time spent collecting in person vs telephone or video SMBG data (3.8 minutes vs 3.2 minutes; *P* = .39) (Table 2). The most common SMBG collection method for in-person/face-to-face visits was continuous glucose monitor (CGM) (n = 10), followed by meter download/home telehealth (n = 5), patient report (n = 3), and directly from log/meter (n = 1). For telephone or video visits, the most common collection method was patient report (n = 72), followed by directly from log/meter (n = 18), CGM (n = 5), meter download/home telehealth (n = 4), and secure message (n = 2).

DISCUSSION

We found that the mean amount of time spent collecting and documenting/formatting SMBG data was only 4.6 minutes; however, this still represented a substantial portion of visit time. For telephone and CVT/VVC appointments, this represented > 25% of total visit time. While CPPs make important contributions to interprofessional team management of patients with diabetes, their cost is not trivial.[6-8] It is worth exploring the most effective and efficient ways to use CPPs. Our results indicate that streamlining SMBG data collection may be beneficial.

Pharmacy technicians, licensed practical nurses/clinical associates, registered nurses/nurse care managers, or other team members could help improve SMBG data collection. Using other team members is also an opportunity for comanagement, for team collaboration, and for more patients to be seen. For example, if a CPP currently has 12 patient encounters that last 20 minutes each, this results in about 240 minutes of direct patient care.

TABLE 2 Time Spent by Visit Type

Data task	Patient visit type, mean (SD), min		*P* value
	Telephone or video (n = 101)	In person (n = 19)	
Collection	3.2 (2.5)	3.8 (2.4)	.39
Documentation/formatting	1.1 (1.4)	2.1 (3.3)	–
Total	16.3 (8.7)	40.5 (23.4)	–

If patient encounters were 16 minutes, CPPs could have 15 patient encounters in 240 minutes. Saved time could be used for other clinical tasks involved in disease management or clinical reminder reviews. While there are benefits to CPPs collecting SMBG data, such as further inquiry about patient-reported values, other team members could be trained to ask appropriate follow-up questions for abnormal blood glucose readings. In addition, leveraging current team members and optimizing their roles could prevent the need to acquire additional full-time equivalent employees.

Another opportunity to increase efficiency in SMBG data collection is with SMBG devices and EHR integration.[4,9] However, integration can be difficult with different types of SMBG devices and EHR platforms. Education for patients and practitioners could help to ensure accurate and reliable data uploads; patient internet availability; data protection, privacy, and sharing; workflow management; and clear patient-practitioner expectations.[10] For example, if patient SMBG data are automatically uploaded to practitioners, patients' expectations for practitioner review of data and follow-up need to be determined.

We found a subset of 23 patient encounters where data collection and documenting/formatting represented more than half of the total visit time. In this subset, 13 SMBG reports were pulled from a log or meter, 8 were patient reported, and 3 were meter download or home telehealth.

Limitations

A potential reason for the lack of statistically significant differences in SMBG collection method or visit type in this study includes the small sample size. Participation in this work was voluntary, and all participating CPPs had ≥ 3 years of practice in their current setting, which includes a heavy workload of diabetes management. These pharmacists noted self-established procedures/systems for SMBG data collection, including the use of Excel spreadsheets with pregenerated formulas. For less experienced CPPs, SMBG data collection time may be even longer. Pharmacists also noted that they may limit time spent collecting SMBG data depending on the patient encounter and whether they have gathered sufficient data to guide clinical care. Other limitations of this work include data collection from a single institution and that the time documented represented estimates; there was no external monitor.

CONCLUSIONS

In this analysis, we found that CPPs spend about 3 minutes collecting SMBG data from patients and about an additional 1 minute documenting and formatting data. While 4 to 5 minutes may not represent a substantial amount of time for 1 patient, it can be when multiplied by several patient encounters. The time spent collecting SMBG data did not significantly differ by collection method or visit type. Opportunities to increase efficiency in SMBG data collection, such as the use of nonpharmacist team members, are worth exploring.

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Disclaimer

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Ethics and consent

This work was deemed nonresearch by the Boise Veterans Affairs Medical Center Research and Development department.

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