Little Time for Diabetes Management in the Primary Care Setting

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PURPOSE

This study was conducted to determine how time is allocated to diabetes care.

METHODS

Patients with type 2 diabetes who were receiving care from the internal medicine residents were shadowed by research nurses to observe the process of management. The amount of time spent with patients and the care provided were observed and documented.

RESULTS

The total time patients spent in the clinic averaged 2 hours and 26 minutes: 1 to 9 minutes waiting, 25 minutes with the resident, and 12 minutes with medical assistants and nurses. The residents spent an average of only 5 minutes on diabetes. Glucose monitoring was addressed in 70% of visits; a history of hypoglycemia was sought in only 30%. Blood pressure values were mentioned in 75% of visits; hemoglobin A1c (A1C) values were addressed in only 40%. The need for proper foot care was discussed in 55% of visits; feet were examined in only 40%. Although 65% of patients had capillary glucose levels greater than 150 mg/dL during the visit and their A1C averaged 8.9%, therapy was intensified for only 15% of patients.

CONCLUSIONS

During a routine office visit in a resident-staffed general medicine clinic, little time is devoted to diabetes management. Given the time pressures on the primary care practitioner and the need for better diabetes care, it is essential to teach an efficient but systematic approach to diabetes care.

Diabetes is a major public health problem of epidemic proportions and is associated with increased morbidity, mortality, and cost. Approximately 16 million Americans currently have diabetes, including about 6 million who are undiagnosed, and the number is expected to rise to approximately 22 million by the year 2025.[1] Most of these individuals have type 2 diabetes,[2] which often is described as adult onset, although onset in childhood and adolescence is increasing rapidly.[3,4] The increasing prevalence of type 2 diabetes is due to a combination of underlying changes in lifestyle (increased prevalence of obesity[5] and sedentary lifestyle[6,7]), the aging of the population,[8] and the enrichment of the population with racial/ethnic groups that have a genetic predisposition to developing diabetes.[9-12] The presence of diabetes increases the risk of both macrovascular disease (resulting in blindness[13] and kidney failure[14]) and macrovascular disease (resulting in leg amputation[15] and cardiovascular complications such as myocardial infarction[16]). Diabetes-related mortality is particularly high in women.[17] Largely because of such chronic complications, the annual healthcare costs for individuals with diabetes have been estimated to be close to fourfold higher than those for individuals without diabetes. The annual US expenditures related to diabetes were estimated to be approximately $78 billion in 1997, which represented 8% of total healthcare costs.[18]

In the United States, persons with diabetes are seen largely in the primary care setting,[19] where it has been difficult to meet American Diabetes Association (ADA) standards for diabetes management. In many practices, foot examinations[20-24] and dilated eye examinations[22,23] are infrequent, associated abnormalities in blood pressure[25,26] and lipids[22,27] are not managed aggressively, and glucose levels are high.[22,28] The evaluation of overall glycemic control, as indicated by measurement of hemoglobin A1c (A1C), is now increasing (71% of Medicare recipients had at least 1 measurement a year in 1998[29] compared with less than once a year in 84% of patients in 1990 to 1991[30]). However, Harris et al[31] estimated that 37% of Americans with diagnosed diabetes had A1C levels greater than 8% in 1988 to 1994, which is considerably higher than the ADA goal of an A1C level below 7%.

It is possible that the shortcomings of practice are due, in part, to time constraints that limit the attention that can be given to patients with complex disorders such as diabetes. The Direct Observation of Primary Care (DOPC) Study, conducted from 1994 to 1995, found that patients often saw physicians face-to-face for less than 10 minutes during the typical office visits.[32-36] Yet, many physicians feel that they are seeing more patients more often now than they were 5 years ago.[37-40] Limitations in time and high clinic volumes have been shown to have adverse effects on patient-physician communication and meeting patients' psychosocial needs.[32,35] However, we currently have little understanding of the use of time in relation to managing a specific disease such as diabetes. The Improving Care of African Americans with Diabetes (IPCAAD) Project[41] is directed at improving diabetes management of African American patients in a large primary care site in Atlanta. As the interventions for the project were being designed, it became apparent that the amount of time available for diabetes management during the course of a routine patient visit was unknown. Accordingly, the present study was conducted to evaluate diabetes patient flow in a typical municipal hospital primary care clinic and to determine how time was used for diabetes-related care during patient visits. Research nurses and/or assistants observed and timed each step during the visits of 20 patients, and documented the actions of the physicians in managing hyperglycemia.

RESEARCH DESIGN AND METHODS

Setting

This study was conducted in 2 modules of the General Medical Clinic of Grady Health Systems in Atlanta, Georgia. In this clinic, approximately 4000 patients per month receive care provided by approximately 180 internal medicine residents, who are supervised by faculty from the Division of General Medicine, Department of Medicine, Emory University School of Medicine, and assisted by 3 technicians, 5 clerks, 3 to 4 registered or licensed professional nurses, a dietitian, and a pharmacist. Each resident participates in 1 continuity clinic per week; each half-day session in each module is staffed by 7 to 8 residents, 3 supervising faculty members, and 3 nurse practitioners or physician's assistants. A recent survey indicates that approximately 30% of the patients are diagnosed with diabetes.[42] Because residents see up to 6 to 8 patients per half day, each resident usually sees 1 to 2 patients with diabetes each half day.

Figure 1.

OFFICE VISIT CHECKLIST

OFFICE ACTIVITY	MINUTES	PATIENT INFORMATION	DATE
Check-in to triage		Patient name	
Triage		Patient MRN no.	
Triage to resident visit		Patient date of birth	
Resident visit		Year diabetes onset	
Resident with attending		A1C	
Attending visit		Weight/height	
Resident follow-up visit		Blood pressure	
Waiting time D/C nurse		Capillary glucose	
Time with D/C nurse		Fasting/random/not known	
PROCESS DIABETES ADDRESSED	**RESPONSES**		
IMMEDIATE PAST HISTORY			
Hypoglycemic episodes	Y/N	No. episodes/doses/week	
Hospital visits	Y/N		
Other clinic visits	Y/N	Referral ? Type	
Home BG monitoring	Y/N	Referral ? Type	
Monitoring log returned	Y/N		
Diet mentioned	Y/N	Type of diet?	
Exercise	Y/N	Amount/week	
Visual changes	Y/N		
LAB VALUES DISCUSSED			
AccuCheck mentioned	Y/N		
Current A1C	Y/N	Past A1C	Y/N
Lipids	Y/N		
Urine protein	Y/N		
Blood pressure	Y/N		
Home BG self-monitoring	Y/N		
PHYSICAL EXAM	Y/N		
Foot exam actually done	Y/N	Foot exam discussed	Y/N
Ophthalmic exam	Y/N		
Microvascular effects	Y/N	Nephropathy issues	Y/N
		Neuropathy issues	Y/N
		Retinopathy issues	Y/N
Macrovascular effects Cardiovascular		Cerebral : HA/dizziness	Y/N
		Peripheral: circulatory pain or cramping	Y/N
		Chest pain or pressure	Y/N
SUMMARY			
Medication changes?	Y/N	Incoming vs outgoing Meds	Over
Approximate minutes spent discussing diabetes or diabetes-related topics			

Observation sheet for office visits of patients with diabetes.

Sample

During June and July of 1999, a convenience sample was selected of 20 established patients with type 2 diabetes. Patients were first approached for permission to be observed during the visit; if granted, permission was then obtained from the patient's physician. The acceptance rate was high; only 1 patient of 21 patients who were approached refused to be involved in the study. A trained research nurse or assistant followed the patient through each step of the visit, recorded the time at each step, noted whether predefined questions were asked and examinations were performed, and noted the time involved. This study was reviewed and approved by the Emory University Institutional Review Board.

Instrument

To develop a checklist specifying the manner and detail in which each patient-physician observation was to be evaluated, the ADA guidelines for care were reviewed and diabetes specialists and general internists were consulted about minimum expectations for a patient visit. These content specialists made primary recommendations for the checklist, which then underwent successive reviews by study personnel. After finalizing the document, the observational checklist included documentation in the following areas: (1) time of patient check-in, time in triage, time with the resident, time the resident spent discussing the patient with a faculty member, time the faculty member and resident spent with the patient, time the resident spent with the patient after the faculty member left, and time the patient spent being discharged; (2) time involved in discussing diabetes-related history, such as whether the patient had had any hypoglycemic episodes, whether home glucose monitoring was being performed and what the results were, and discussion related to potential microvascular and macrovascular complications; (3) time involved in discussing measurements, such as glucose levels determined during the visit, A1C levels, blood pressure, lipid levels, and urine protein; and (4) physical examination items and time involved. To assess management of hyperglycemia, incoming and outgoing medications were documented as well. The final checklist is shown in Figure 1.

Table 1.

Patient Demographics

Characteristics	n	%	Mean ± SEM	Range
Female		65		
African American		90		
Age, y			62.3 ± 2.0	51.4-79.4
Duration of diabetes, y			14.3 ± 2.6	0.1-38.0
Weight, lb			208.6 ± 17.6	102.0-338.0
Blood pressure, mm Hg				
Systolic			151.9 ± 7.0	118-217
Diastolic			80.2 ± 3.9	58-120
Most recent A1C, %			8.0 ± 0.6	5.5-13.2
Random capillary glucose level, mg/dL	20		213.5 ± 17.9	107-338
Random glucose level >150 mg/dL	13		253.5 ± 16.4	154-338

Determinations

Capillary glucose was measured with the MediSense Precision PCx Point-of-Care System (Abbott Laboratories, Bedford, MA). A1C was measured by the Grady Clinical Laboratory using methodology approved by the National Glycohemoglobin Standardization Program.

Analysis

Data are expressed as mean ± SEM. Standard descriptive statistics were determined using the Statistical Package for the Social Sciences (SPSS) computer program version 10 (SPSS Inc, Chicago, IL).

RESULTS

Patient and Resident Demographics

As shown in Table 1, most of the 20 patients were African American, two thirds were female, average age was 62 years, average duration of diabetes was 14 years, average blood pressure was 152/80 mm Hg, average A1C was 8.0%, and average random capillary glucose level was 214 mg/dL. Thirteen of the 20 patients had random glucose levels greater than 150 mg/dL. The 20 patients were seen by 19 residents, of whom 37% were female and 21% were African American. The average age of the residents was 27 ± 2 years; 21% were in their first year of internal medicine residency training, 58% in their second year, and 21% in their third year.

Table 2.

Distribution of Patient Visit Time in Minutes

Time Categories	Mean ± SE	Range
Check-in process	38.6 ± 4.8	0-70
Time in triage	4.9 ± 0.6	2-11
Patient waiting for resident	31.2 ± 5.9	0-93
Patient with resident	17.1 ± 2.3	6-45
Resident with attending	12.4 ± 2.0	0-35
Attending and resident with patient	1.4 ± 0.5	0-10
Patient with resident for discharge	6.2 ± 0.9	0-15
Patient waiting for discharge nurse	27.3 ± 5.3	0-68
Patient with discharge nurse	7.3 ±1.9	0-25

Patient Flow

The total time that the patients spent in the clinic averaged 2 hours and 26 minutes (Table 2). Including the resident visit of 17 minutes, the resident and attending time with the patient of 2 minutes, and resident follow-up with the patient of 6 minutes, the patients spent an average of 25 minutes (17% of the total time) face-to-face with the physician during the visit. An average of 1 hour and 49 minutes (75% of the patients' total clinic time) was spent waiting, and 12 minutes (8% of the time) was spent with either the triage medical assistant or the discharge nurse. During the 25 minutes face-to-face with the resident, an average of 5 ± 0.7 minutes was spent on diabetes or diabetes-related issues.

Diabetes History and Physical Examination

Home glucose monitoring was addressed in 70% of the visits, but the patients were questioned about a history of hypoglycemia in only 30% of the visits. The need for proper foot care was mentioned during 55% of the visits. However, in only 40% of the visits were the shoes removed and the feet examined. The need for regular dilated eye examinations was discussed in 25% of the visits.

Discussion of Diabetes-Related Laboratory Values

Blood pressure values were mentioned during 75% of the visits, capillary glucose values that had been determined during the visit were mentioned in 68% of the visits, and recent lipid values were discussed in 50% of the visits. The recent A1C value was mentioned in 40% of the visits, and urine protein results were mentioned in 39% of the visits (assessments of mention of capillary glucose and urine protein were obtained in 19 of the 20 visits).

Glucose Management

Random capillary glucose values obtained during the visit were less than 150 mg/dL (range=107-144 mg/dL) in 7 patients, and none of these patients had a subsequent change in therapy. Their most recent A1C values prior to the visit or within 2 weeks after the visit averaged 6.9 ± 0.5%. Thirteen patients had random capillary glucose values over 150 mg/dL (range=154-338 mg/dL), an average capillary glucose level of 253 ± 16 mg/dL, and an average A1C value of 8.9 ± 0.8%; their duration of diabetes averaged 14 ± 3 years. However, despite such current and chronic glycemic abnormalities, only 2 patients had their diabetes therapy intensified with an increase in dosage or the addition of a new diabetes medication.

DISCUSSION

The advent of managed care has had a profound effect on the healthcare delivery system of the United States, and the concomitant rise in patient volumes has increased the need for effective time management. Although time constraints are frequently reported as barriers to care,[37-40] little is known about the actual use of time in different primary care settings. In this study of patient flow and time management in a municipal hospital primary care clinic, which was typical of many physician training sites, there was relatively little time spent with the physician during a routine visit and even less time spent on diabetes. The waiting time of 1 hour and 49 minutes was considerable. However, because the waiting time was highly variable (range=0-93 minutes before seeing the physician and 0-68 minutes before seeing the discharge nurse), it would be difficult to use the time as an opportunity for diabetes-related group education. Individual education could be presented during the waiting time using videotapes and other educational materials.

In addition to the long waiting time, the patients spent an average of 25 minutes face-to-face with their own physicians. This is more face-to-face time than primary care physicians customarily expend in routine practice, according to the results of the DOPC Study, which examined the demands of real-world primary care practice in the managed-care environment.[32-36] In the DOPC study, the amount of time that the patients saw the physicians face to face varied from an average of 8.8 minutes to 12.5 minutes.[32] The longer time spent face-to-face with a physician in the present

study may be attributed to factors such as the relative inefficiency of junior physicians, the lack of office assistance (eg, in documenting the use of medications), and the low literacy levels of the urban patient population,[43] which might prolong the process of taking the medical history and increase the need for explaining contemplated diagnostic and therapeutic approaches.

Given the time invested in these patient visits, it might have been expected that considerable attention would have been devoted to the management of diabetes as a representative chronic illness. However, the opposite was found to be true. Diabetes care involved an average of only 5 minutes, and many important standard-of-care items were often omitted. Searches for problems with hypoglycemia, foot examinations, and discussions of A1C values and urine protein screens were all conducted in less than 50% of the visits. Moreover, clinical decision making was also a problem because antidiabetes therapy was often not intensified despite the presence of high glucose levels determined during the visit. Such "clinical inertia" has been described in other settings as well.[44-47] To the extent that these practices are common in primary care settings, they could contribute to the widespread problems with glycemic control in the United States. Studies conducted within the last several years of patients managed in primary care settings reported average A1C levels of 9.7% in 185 patients in California,[48] 8.0% in 376 patients in Michigan,[28] 7.9% in 241 patients in Washington,[49] 8.7% in 68 patients in New York,[50] 8.5% in 5332 patients in Pennsylvania,[51] and 8.6% in 879 patients in Indiana.[52]

In other settings, shorter visit times have been associated with physician performance problems such as inappropriate prescribing of nonsteroidal antiinflammatory drugs,[53] reduced attention to patients' psychosocial concerns,[54] and limited discussion of management options.[55,56] However, the DOPC study found that high-volume and low-volume physicians provided similar care,[36] although the high-volume physicians were more efficient. Therefore, the finding in the present study of limited time allotted for diabetes care does not by itself ensure that management is doomed to inadequacy; the limitations of time might simply demand a level of efficiency that physicians in training rarely achieve. Nevertheless, the observation that diabetes management by primary care physicians in practice is also often substandard indicates that both physicians in training and physicians in practice would benefit from education in the paradigms of efficient quality care.

Good glycemic control can be achieved in diabetes specialty sites that provide care to either a referral population with good insurance coverage[57] or an urban hospital population which is predominantly poor and/or uninsured.[58] Based on this knowledge and the present study findings, the essence of specialist approaches was distilled into a strategy that can be applied when time is limited. This strategy, called the 5-Minute Scenario, is outlined at the top of Figure 2. First, run the numbers early in the visit. Review blood pressure, lipids, use of aspirin, and glucose patterns from home monitoring (including problems with hypoglycemia), and make appropriate adjustments in medications. Second, order a urine albumin/creatinine ratio and a dilated eye examination if the patient's screening is not up to date. Third, be sure to examine the feet, including pulses, sensation, and integrity of the skin. This paradigm can easily be remembered using the mnemonic, PLAGUE-F, as shown at the bottom of Figure 2. This mnemonic currently is being incorporated into diabetes-related teaching of students and residents at Emory. The experience of one of the authors (LSP) indicates that the strategy can be carried out in approximately 5 minutes if a flowsheet is used and if patients do not have complex problems (eg, management with a multidose insulin regimen).

STUDY LIMITATIONS

This study has several limitations. Although the findings were relatively uniform (time spent on diabetes-related care ranged only from 0-10 minutes over 20 patient visits), the sample size was small. Some bias likely was conferred by the process of observation; physicians were aware of the presence of the observers even though the observers attempted to be as inconspicuous as possible. However, it was anticipated that the presence of observers should have increased the attention given to disease management. It is also possible that variations in administering the checklist contributed to variations in documentation since several different research assistants and nurses participated in data collection. However, an attempt was made to minimize interrater error by carefully reviewing, clarifying, and practicing data collection steps prior to the observations. The presence of comorbities may also have

Figure 2.

5-MINUTE SCENARIO

Early in the visit, run the numbers.

Pressure	Note blood pressure, increase Rx for systolic BP>130 mm Hg
Lipids	Note last lipid values, increase Rx for LDL>100 mg/dL, consider Rx for low HDL or high triglycerides
Aspirin	Note use of aspirin, Rx if not taking
Glucose	Note last A1C, order if not up to date
	Note home glucose monitoring values, calculate average by time of day, before/after meals
	Note hypoglycemia (none, <60 mg/dL, severe, typical time of day)
	Increase Rx for capillary glucose >150 mg/dL during visit and/or for elevated A1C or home glucose values

Early in the visit, review and order screening tests.

Urine protein	Note last spot albumin/creatinine value, order if not up to date
Eyes	Note last dilated eye examination, refer if not up to date

Physical examination

Feet	Note skin integrity, pulses, edema, vibration time (128 cycle tuning fork, base of great toe)

Mnemonic for Diabetes Management During Office Visits

P	=	Pressure
L	=	Lipids
A	=	Aspirin
G	=	Glucose
U	=	Urine albumin/creatinine ratio
E	=	Eye examination (dilated)
F	=	Foot examination

5-Minute Scenario and Mnemonic for Diabetes Management During Office Visits

limited the amount of attention that could be given to diabetes. Yet, separate studies indicate that comorbidity is unrelated to glycemic control in either diabetes specialist or primary care settings.[59,60] Finally, there may be important differences in performance between physicians in practice, residents in their first, second, or third year of training, and practitioners in other settings, which could limit generalizability. The sample size was too small to determine whether management improves with experience, but the prevalence of problems with clinical inertia and glycemic control in a variety of primary care settings argues in favor of teaching a paradigm such as that proposed.

CONCLUSIONS

In conclusion, the present study indicates that limitations in time may compromise diabetes management in the primary care setting. It will be important to determine whether the findings are generalizable both to the care provided by physicians in practice and to the management of other disorders. However, given the current time pressure faced by many practitioners, the office visits of patients with diabetes should be structured proactively with concrete guidelines to optimize their care. The merits of the 5-Minute Scenario proposed as a model for care should be tested for patient satisfaction as well as efficacy and efficiency. Patient waiting time should also be evaluated and ideally reduced or used as an opportunity for patient education. Finally, it will be critical to develop new strategies to teach residents and other primary care providers the importance of intensifying therapy when a patient's glucose levels are high.

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