

Physicians' Perceptions of Reimbursement as a Barrier to Comprehensive Diabetes Care

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Background: As the incidence of diabetes increases, there is growing concern about the adequacy of reimbursement levels for delivering comprehensive diabetes care.

Objective: To investigate physicians' perceptions of the adequacy of reimbursement, as well as resources (eg, staff, facilities, materials), for their treatment of diabetic patients.

Methods: A qualitative exploration using a Web-based survey of 300 physicians (200 primary care providers and 100 endocrinologists) and an online discussion group of 12 physicians, focusing on 10 services recommended by the American Diabetes Association that may be prone to underreimbursement. The 10 services were matched with 4 general diabetes care categories to assess the adequacy of care delivery.

Results: The majority of physician study participants perceived that most of the 10 identified services are inadequately reimbursed—83% to 95% of physicians said Medicaid reimbursement was inadequate, 75% to 89% for Medicare reimbursement, and 67% to 86% for private insurance reimbursement—leading them to spend less time with each patient. This reduction in time was a limiting factor to providing comprehensive diabetes care. The survey also revealed differences between endocrinologists and primary care physicians; for example, medical nutrition therapy was offered by 50% of endocrinology practices compared with only 29.5% of primary care practices.

Conclusion: This study confirms previous findings that physicians perceive current reimbursement for diabetes care as too low, which limits their ability to perform all the tasks necessary to deliver comprehensive diabetes care. [AHDB. Epub 2009 November 19.]

As the number of patients with diabetes increases, there is growing concern about the adequacy of reimbursement levels for delivering comprehensive diabetes care. In 2005 diabetes was the sixth leading cause of death in the United States¹; it is a major contributor to many disabilities.² In 2007, more than 17 million Americans were diagnosed with diabetes, with associated costs of approximately \$174 billion.^{3,4} More recent estimates of the cost of diabetes care are as high as \$218 billion.⁵⁻⁸ These costs are likely to increase as the incidence of diabetes continues to rise.

Approximately 165 recommendations are listed in the annual American Diabetes Association (ADA) clinical guidelines, "Standards of Medical Care in Diabetes."⁹ The guidelines contain the ADA's key recommendations for the standard of diabetes care. Many recommendations call for multidisciplinary teams to deliver counseling and education to patients with diabetes to establish lifestyle changes and improve outcomes. Previous research underscores the importance

of patient education and its relationship to self-management of diabetes and adherence.¹⁰⁻¹³ In a systematic review of the literature, Loveman and colleagues highlight 6 studies that demonstrate a significant improvement in glycated hemoglobin levels among patients who received education versus patients who did not.¹⁴

Because patients with diabetes tend to be complex and time consuming, their treatment requires significant management support and education; therefore, reimbursement can fall short of the actual costs of providing diabetes care.^{15,16} This may be especially true for activities where reimbursement levels do not adequately reflect the care provided (eg, care coordination and patient education) or are dependent on the setting and/or provider.¹⁷ The cost of diabetes care may be further underestimated by not accounting for other modalities of service delivery, including disease management, and nurse-managed care efforts. Misalignment between payment systems and optimal quality of care could cause some patients to go without necessary services, potentially leading to poorer outcomes and quality of life.

Based on input and feedback from representatives from various medical and diabetes organizations,¹⁸ the present study focused on (1) care coordination, (2) patient education, (3) counseling, and (4) psychosocial

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assessments as they relate to diabetes care and reimbursement. A subset of 10 ADA-recommended activities⁹ that correspond to these 4 general categories of diabetes care were selected, because these activities were identified as being prone to underreimbursement. The Figure illustrates how these 10 ADA-recommended activities map to these 4 general categories of diabetes care. Specifically, this study explored the degree to which providers offer these 10 selected ADA-recommended services in their practices, their perceptions of reimbursement for these services, and other factors affecting the care of patients with diabetes.

Methodology

This qualitative exploration focused on the perceived adequacy of resources as defined by medical and administrative time, facilities, staff, and materials for the general 4 categories of diabetes care and the provision and perceived reimbursement adequacy of the 10 selected ADA-recommended activities that are suspected to be prone to underreimbursement (Figure).

We collected data using (1) a Web-based survey of 200 primary care physicians (PCPs) and 100 endocrinologists, and (2) a follow-on online discussion group of 6 PCPs and 6 endocrinologists to address 3 successive waves of questions derived from the responses of the Web-based survey. A convenience sample of 300 physicians was selected from a market research panel of physicians recruited by Epocrates,¹⁹ who had agreed in advance to respond to short surveys regarding care and payment issues. The 12 physicians in the follow-up online discussion were selected from a market research panel of physicians recruited by Panel Intelligence²⁰ who had agreed in advance to participate in online discussion groups. Participants were restricted to physicians who

KEY POINTS

- ▶ Diabetes care requires ongoing physician follow-up and appropriate patient education. Previous studies suggest that physicians perceive the current reimbursement for diabetes as too low.
- ▶ Findings from this study suggest that providers perceive inadequate reimbursement as the culprit in decreased time spent with each patient, which limits the comprehensive care for diabetic patients and reduces patient adherence.
- ▶ The majority of practices offer instructions or evaluation of self-monitoring blood glucose, but less than half offer multidisciplinary care coordination or medical nutrition therapy.
- ▶ More endocrinologists than primary care providers offer multidisciplinary care coordination, but fewer primary care providers offer psychological screening or smoking-cessation counseling.

were treating adult patients with diabetes and were whole or part owners of their medical practice, to ensure the participants had the best understanding of billing and reimbursement for the practice. All participants were compensated for their participation.

The survey asked whether the physicians offered the 10 ADA-recommended services in their practice; if so, they were asked whether they or a nonphysician staff member provided the service, and whether reimbursement was adequate. In addition, the survey asked whether the respondents felt that they had adequate resources (ie, medical and administrative time, facilities, staff, and materials) in their practice to provide the 4 more general categories of diabetes care.

The online discussion was designed to gain a better

Figure Diabetes Care and ADA-Recommended Guidelines Examined for Them

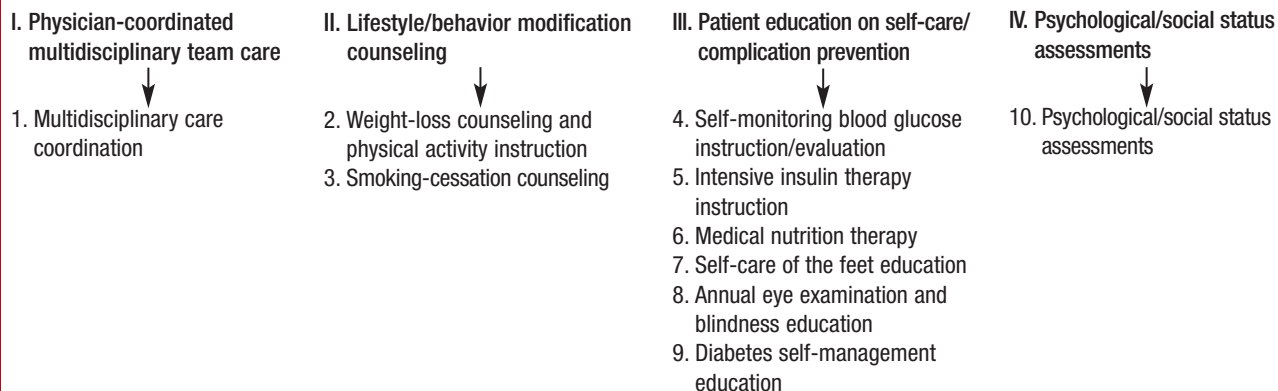


Table 1 Characteristics of Physician Survey Respondents

	All physicians (N = 300)	Endocrinologists (n = 100)	PCPs (n = 200)
Average age, y	46	47	45
Census region, %			
Northeast (1) ^a	28	31	26
Midwest (2)	23	21	24
South (3)	31	30	32
West (4)	18	18	18
Sex, %			
Male	75	77	75
Female	20	16	21
Unknown	5	7	4
Practice setting, %			
Hospital/medical center outpatient clinic	12	11	13
Office setting	72	73	71
Other/unknown	16	16	16
Average experience posttraining, y	14	15	13
Average patients seen in practice/wk, N	239	197	260
Insurance coverage, %			
Private	50	51	49
Medicare	33	33	33
Medicaid ^b	10	8	11
Uninsured	8	7	8
Patients with diabetes, %			
Type 1 ^b	9	16	6
Type 2 ^b	36	53	27
High risk for developing diabetes ^{b,c}	28	23	31

^aNortheast states include CT, ME, MA, NH, RI, VT, NJ, NY, PA. Midwest states, IL, IN, MI, OH, WI, IA, KS, MN, MO, NE, ND, SD. South states, DE, DC, FL, GA, MD, NC, SC, VA, WV, AL, KY, MS, TN, AR, LA, OK, TX. West states, AZ, CO, ID, NM, MT, UT, NV, WY, AK, CA, HI, OR, WA.

^b $P \leq .05$ between endocrinologists and PCPs.

^c Physician respondents identified the percentage of their patients who were at high risk for developing diabetes.

PCPs indicates primary care physicians.

understanding of the physician perceptions that were identified in the Web-based survey. Each panelist responded to 3 waves of questions: 11 initial questions, 10 follow-up questions, and 7 final follow-up questions. The survey involved an asynchronous, threaded discus-

sion, allowing panelists to interact with each other, as well as with the moderator.

To encourage candid and unbiased input, survey respondents and panelists did not know the sponsor of the study or the identities of the other participants. The survey instrument and online panel discussion questions can be found at www.ncdp.com.

Results

The majority of survey respondents were men, and their primary practice setting was a medical office (Table 1). On average, the physicians' practices saw 239 patients each week, with PCPs' practices seeing 30% more patients than endocrinologists' practices (260 vs 197, respectively). Private insurance was the most common payer in endocrinology and in primary care practices, covering approximately half of all patients. PCPs had significantly more patients covered by Medicaid than endocrinologists, as well as more patients at high risk of developing diabetes (as identified by the physician respondents) than endocrinologists ($P \leq .05$). Conversely, PCPs had significantly fewer patients diagnosed with diabetes (types 1 or 2) than endocrinologists.

The 12 panelists and the Web-based respondents had been in practice roughly the same number of years (14.6 years vs 13.9, respectively), ranging from 7 years to 19 years. On average, the panelists treated 320 patients with diabetes per month (sex and payer mix were not collected from the online discussion panelists).

Services Provided by Physician Practices

Among the survey respondents, the most common service provided was self-monitoring blood glucose (SMBG) instruction/evaluation: 89% of all physicians' practices provided this service (Table 2). Conversely, less than 50% of the practices offered multidisciplinary care coordination or medical nutrition therapy (MNT) (49% and 36%, respectively). Significantly more endocrinologists than PCPs reported that their practice provided multidisciplinary care, SMBG instruction/evaluation, intensive insulin therapy instruction, and MNT. Furthermore, significantly fewer endocrinologists than PCPs reported providing psychosocial screening and smoking-cessation counseling.

These survey findings led us to explore with the online panelists the differences between PCPs and endocrinologists regarding provision of multidisciplinary care coordination and MNT, the 2 services that were offered at the lowest rates in the Web-based survey respondents' practices. For multidisciplinary care coordination, about half of the panelists opined that

Table 2 Physician Practices Providing ADA-Recommended Services

Services/instruction ^a	All physicians, % (N = 300)	Endocrinologists, % (n = 100)	PCPs, % (n = 200)
Multidisciplinary care coordination ^b	48.7	64.0	41.0
Self-monitoring blood glucose instruction and evaluation ^b	89.0	96.0	85.5
Intensive insulin therapy instruction ^b	70.7	95.0	58.5
Weight-loss counseling and physical activity instruction	76.0	72.0	78.0
Medical nutrition therapy ^b	36.3	50.0	29.5
Psychosocial screening and assessment ^b	52.0	43.0	56.5
Smoking-cessation counseling ^b	79.9	54.1	92.5
Self-care of the feet education	73.5	71.4	74.5
Annual eye examination and blindness education	74.5	80.6	71.5
Diabetes self-management education	65.4	70.4	63.0

^aThese services were not explicitly defined in the survey; the survey referenced the 2008 Standards of Medical Care in Diabetes.⁹

^bP ≤ .05 between endocrinologists and PCPs.

ADA indicates American Diabetes Association; PCPs, primary care physicians.

endocrinologists have fewer diagnoses to address with their patients than do PCPs, and therefore have more time per patient to devote to diabetes care, and several PCPs mentioned lower reimbursement as a barrier to providing multidisciplinary care coordination. In the absence of a multidisciplinary team, panelists offered different approaches that physicians might take, including more frequent office visits and referring patients to outside educational resources.

When queried about why surveyed PCP practices were significantly less likely to provide MNT compared with endocrinology practices, panelists attributed the difference to the greater volume of patients with diabetes seen by endocrinologists, making the specialist more adept at providing MNT and more likely to have a dietitian in their practice. Both PCPs and endocrinologists reported that they refer patients to other providers outside of their practice for MNT, but panelists also pointed out that providing MNT off-site is not ideal, because it makes it more difficult for the physician to ensure patient compliance. One online panelist stated that, "Providing this service at the office ensure[s] more compliance and more [interaction] with [a] nutritionist for diabetic [management]. I think on-site MNT would be ideal and would improve quality of care and patient satisfaction."

Nonphysician Staff Providing Diabetes Services

Among surveyed physicians whose practices offer each service, with the exception of SMBG instruction

(49%) and MNT (29%), the services were more often provided by physicians rather than nonphysician staff within the practice (Table 3). The services most often provided by a physician (vs nonphysician staff) were smoking-cessation counseling (86%) and annual eye examinations and blindness education (91%). Significantly more PCPs than endocrinologists reported that they provided 4 of the services themselves: weight-loss counseling, MNT, annual eye examination and blindness education, and diabetes self-management education. For the other 6 ADA services, there was no significant difference between provider types.

The findings that only 36% of practices offer MNT (Table 2) and that nonphysicians provided MNT at 71% of the practices (Table 3) was consistent with comments from the online panelists, who indicated that dietitians were more likely to provide MNT than physicians, whether off-site or in the practice. Most panelists reported providing some education and counseling in their office, either personally or through a nonphysician staff member, whereas some panelists referred their patients to an outside registered dietitian. Together, the results from the Web-based survey and online focus group suggest the need for a registered dietitian or a certified diabetes educator to help patients manage their diabetes, whether co-located in the physician's practice or off-site.

Physician Perceptions of Adequacy of Resources

Less than half of the survey respondents reported

Table 3 Physicians Offering a Service Who Provide Specific Services Themselves

Services/instruction	All physicians, %	Endocrinologists, %	PCPs, %
Multidisciplinary care coordination (Endocrinologists, n = 64; PCPs, n = 82)	64	67	62
Self-monitoring blood glucose instruction and evaluation (Endocrinologists, n = 96; PCPs, n = 171)	49	48	50
Intensive insulin therapy instruction (Endocrinologists, n = 95; PCPs, n = 117)	70	68	71
Weight-loss counseling and physical activity instruction ^a (Endocrinologists, n = 72; PCPs, n = 156)	68	50	76
Medical nutrition therapy ^a (Endocrinologists, n = 50; PCPs, n = 59)	29	16	41
Psychosocial screening and assessment (Endocrinologists, n = 43; PCPs, n = 113)	75	70	77
Smoking-cessation counseling (Endocrinologists, n = 53; PCPs, n = 185)	86	81	87
Self-care of the feet education (Endocrinologists, n = 71; PCPs, n = 149)	78	76	79
Annual eye examination and blindness education ^a (Endocrinologists, n = 79; PCPs, n = 143)	91	85	95
Diabetes self-management education ^a (Endocrinologists, n = 69; PCPs, n = 126)	62	48	70

^a*P* ≤.05 between endocrinologists and PCPs.
PCPs indicates primary care physicians.

that their practices had adequate resources for psychological/social status assessments, but reported adequate resources (ie, medical and administrative time, facilities, staff, and materials) for the other 3 general categories of diabetes care (**Table 4**). Significantly more endocrinologists than PCPs reported that they had adequate resources to provide multidisciplinary team care, whereas significantly fewer endocrinologists than PCPs reported they had adequate resources to provide psychological/social status assessments.

Like the survey respondents, most online panelists did not think they had adequate resources to provide psychological/social status assessments. In particular, several mentioned time constraints and low or nonexistent reimbursement as limiting factors. However, unlike the survey respondents, most panelists reported that there were inadequate resources (ie, medical and administrative time, facilities, staff, and materials) for the other 3 general categories of diabetes care (ie, physician-coordinated multidisciplinary team care, lifestyle and behavior modification counseling, and patient education on self-care and complication prevention). Specifically, panelists indicated that they did not have adequate resources or that the reimbursement was insufficient.

Perceptions of Adequacy of Reimbursement

Survey respondents who indicated that their practice provided any of the 10 ADA-recommended services (**Table 2**) were also asked about adequacy of reimbursement by 3 payers: Medicare, Medicaid, and private insurance (**Table 5**). The overwhelming majority of respondents reported that all 3 of the payers have inadequate reimbursement. Two thirds of respondents who provide multidisciplinary care coordination reported reimbursement to be inadequate for all 3 payers. Psychosocial screening/assessment was perceived as being inadequately reimbursed by the largest percentage of respondents (85%).

Similarly, most respondents perceived the reimbursement of specific payers to be inadequate. Medicaid reimbursement was most often perceived as inadequate, whereas reimbursement by private insurers was least often perceived as inadequate, with Medicare falling in between. These differences across payer types were consistent for every service. Furthermore, these differences were statistically significant for all services except psychosocial screening and assessment. Although physicians perceived reimbursement by private insurers to be the best among the 3 payer types, it

Table 4 Physicians Reporting Adequate Resources for Diabetes Care

Categories of care	All physicians, % (N = 300)	Endocrinologists, % (n = 100)	PCPs, % (n = 200)
Physician-coordinated multidisciplinary team care ^a	68	79	63
Lifestyle and behavior modification counseling	72	67	74
Patient education on self-care and complication prevention	85	83	87
Psychological and social status assessments ^a	47	35	53

^aP ≤ .05 difference between endocrinologists and PCPs.
PCPs indicates primary care physicians.

Table 5 Physicians Offering a Service Who Believe Reimbursement Is Inadequate

Services/instruction	Inadequate reimbursement			
	All 3 payer types, ^a %	Medicare, %	Medicaid, %	Private, %
Multidisciplinary care coordination ^b (n = 146)	66	83	94	67
Self-monitoring blood glucose instruction and evaluation ^b (n = 267)	78	87	95	80
Intensive insulin therapy instruction ^b (n = 212)	77	85	94	79
Weight-loss counseling and physical activity instruction ^b (n = 228)	83	88	95	84
Medical nutrition therapy ^b (n = 109)	72	82	94	75
Psychosocial screening and assessment (n = 156)	85	89	93	86
Smoking-cessation counseling ^b (n = 238)	81	86	94	83
Self-care of the feet education ^b (n = 220)	80	84	92	81
Annual eye examination and blindness education ^b (n = 222)	70	75	83	70
Diabetes self-management education ^b (n = 195)	81	85	95	82

^aPercentage of respondents who report all 3 payer types' reimbursement (ie, Medicare, Medicaid, and private health insurance) as inadequate.
^bP ≤ .05 between payer types.
Note: No significant differences were found in perceived adequacy of various payers' reimbursement between endocrinologists and PCPs for any service.
PCPs indicates primary care physicians.

was still considered inadequate by at least 67% of survey respondents for all services. More than 90% of respondents perceived Medicaid reimbursement to be inadequate for all services, except for eye examinations (83% respondents; Table 5).

Similar to the survey results, a common theme among panelists was that most services were inadequately reimbursed. In addition, time for preventive care and lifestyle programs and telephonic blood glucose adjustment counseling were among the inadequately reimbursed services mentioned. Online panelists suggested that low reimbursement per visit drives physicians to see more patients and spend less time with each patient. Several panelists reported that they were not adequately reimbursed for any services, stating, "We are underreimbursed for everything we do."

Online panelists agreed with the Web-based survey

respondents that reimbursement by private payers was inadequate, which concurs with the survey results in Table 5. Panelists cited prescribing restrictions and nonreimbursement for necessary ancillary services. Echoing the survey results, many online panelists cited low reimbursement rates from Medicaid and Medicare. Several panelists reported that they no longer saw Medicaid patients or plan to stop seeing any patient whose insurance has inadequate reimbursement, stating they "know of many physicians who have eliminated Medicaid, Medicare, and/or certain private payers because of inadequate reimbursement."

Physician Perceptions on Barriers to Providing Comprehensive Diabetes Care

The survey respondents and the online panelists reported that inadequate reimbursement and insufficient

time per patient (due to underreimbursement) are major barriers in providing comprehensive diabetes care. Overall, 32% of survey respondents said they were unable to provide comprehensive diabetes care, and most cited time or reimbursement as the major barrier. Nearly all the online panelists agreed that reimbursement was a primary barrier. Online panelists advised that higher reimbursement would lead to better comprehensive diabetes care, stating, "I would have a diabetic nurse educator in my practice, and I would be able to spend more time with each of my diabetic patients."

Survey respondents and online panelists also reported other barriers to providing comprehensive diabetes care, including patient nonadherence and physician education. Several panelists mentioned patient depression, lack of patient education, and the difficulty of patients changing habits as barriers. Some indicated that they did not have the necessary training to provide some components (eg, behavior modification or psychological assessment) of comprehensive diabetes care.

Discussion

This research yielded several important findings about physicians' perceptions of the inadequacy of reimbursement and other barriers to providing comprehensive diabetes care. From the Web-based survey, endocrinologists' practices appeared to offer more technical services (ie, SMBG instruction/evaluation, insulin therapy instruction, and MNT), whereas PCPs' practices offered more primary care services (ie, psychosocial screening/assessment and smoking-cessation counseling). Some of these differences are understandable, because it was reported by participants that it might not be cost-effective for PCP practices (which see fewer patients with diabetes than endocrinology practices) to employ a registered dietitian to provide MNT. In addition, endocrinologists were more likely than PCPs to use nonphysician staff in their practice. Because of lower reimbursement levels, PCPs may be less able to afford additional staff in their practices than endocrinologists and therefore must provide the service themselves.

Among practices that offered the services, there was also variation between provider types regarding which services were provided by physicians versus nonphysician staff. However, factors other than provider type may be driving the decision to engage nonphysician staff. For example, ADA guidelines promote referring patients to a registered dietitian to provide MNT,⁹ which is consistent with our findings of only 29% of physicians providing MNT. Practices that did not provide services may have referred patients to other

sources of care, and practices that offer MNT may employ a trained nutritionist or registered dietitian (rather than the physician) to provide this service. Regardless of the underlying reason, the survey results suggest that services provided to patients with diabetes differ between endocrinology and PCP practices.

Although there were differences between providers regarding which services were offered, the Web-based survey indicated that both specialties felt they had inadequate resources to provide psychological/social status assessment in their practices. The panelists agreed, and many suggested that this service was "best left to other health professionals." Psychosocial assessments/counseling require time-intensive formal evaluation (eg, instrument administration and scoring) and interventions with follow-up and appropriate coordination/referral. Lacking adequate resources, physicians reported referring patients elsewhere for these and other services (eg, nutrition education).

Virtually all the panelists indicated that having more time to spend with each patient would lessen the need for referrals to other providers, thereby diminishing a barrier to providing comprehensive diabetes care. Referring patients elsewhere may be necessary, but it also may contribute to the fragmentation of delivering comprehensive diabetes care. For example, patients may not receive the referred services for a variety of reasons; they may not understand the reason for the referral, the service may not be adequately covered by their insurance, or they may be unable to afford copayments for multiple visits to different clinicians. Building on the current literature that shows adherence to medications, follow-through with appointments, and participation in nutrition counseling are related to better patient outcomes,²¹⁻²⁴ further research is needed to confirm the panelists' view that referring patients outside of the practice impedes patient adherence.

Not only were resources (ie, medical and administrative time, facilities, staff, and materials) perceived to be inadequate, but some survey respondents also cited low reimbursement as a barrier to providing comprehensive care. In addition, 10 of the 12 panelists also viewed reimbursement to be inadequate, and several thought this was true for all diabetes-related services. The widespread view of Medicaid reimbursement inadequacy has led some physicians to report that they have rejected Medicaid patients, which is likely to make it difficult for low-income patients with diabetes to find a provider. This finding echoes previous research that finds physicians less likely to accept Medicaid patients in states with lower Medicaid reimbursement levels.²⁵

Shifting the cost of undercompensated care to other payers is unlikely, because most survey respondents and panelists indicated that all payers' reimbursement rates were inadequate.

Because physicians report they do not have adequate time with each patient, this may impair their ability to properly educate patients. Indeed, panelists reported that patients' lack of diabetes education and poor motivation to change unhealthy habits contributed to non-adherence. In addition, participants stated that patients with complications from diabetes are more complex and require longer physician visits. Responders cited decreased time for each patient as a result of low reimbursement as a major barrier to their ability to provide comprehensive diabetes care.

The information gathered from this study contributes to the national discussion on the effect inadequate reimbursement levels have on diabetes care and outcomes. These results suggest that given the complexity of diabetes, better alignment, including a higher reimbursement level, is needed between the payment systems (ie, benefit design, covered services, and reimbursement levels) and the ADA guidelines. At current reimbursement levels, our findings indicate that providers are unable to "do it all" in the limited amount of time they have with each patient; and, accordingly, patient care suffers. Ultimately, physicians report that they are unable to provide comprehensive diabetes care, despite the ADA's thorough and comprehensive guidelines. As one panelist said, "guidelines without adequate reimbursements and services to patients are meaningless." That is, physicians cannot follow guidelines without sufficient payment to support providing the services.

The obvious suggestion—increase current reimbursement levels—is difficult in the current economic environment, but not impossible. In addition, insurers and policymakers can use a variety of other tools to better align reimbursement and the ADA guidelines, including:

- Expanding insurance coverage (eg, covering supportive diabetes services that are not currently covered and therefore may not be provided by many physicians)
- Addressing Medicare's and other insurers' requirements for providers to become an "approved entity" and the allowable frequency of education and training visits^{26,27}
- Encouraging alternative approaches for physician visits, which allow for more time per patient (eg, shared or group medical appointments).²⁸

By understanding physician perceptions of reimbursement as a barrier to providing comprehensive diabetes care, policymakers and insurers may be better able to align ADA guidelines and reimbursement and ultimately improve diabetes care.

Limitations

To ensure that our sample was familiar with reimbursement issues and diabetes care, we targeted physicians who were whole or partial owners of their practices and whose practices treated a large number of diabetic patients. By using the Internet for both data sources, our convenience sample was likely to be more technology-oriented than the general population of physicians.

In addition, the survey did not explicitly define each of the 10 diabetes services, hence the interpretation by the physicians of the service definitions may also vary. By focusing on activities that were suspected of being prone to underreimbursement, our results have limited generalizability to all facets of diabetes care. All survey responses were based on the physicians' perceptions and knowledge of their practice and patients; therefore, their responses may not fully represent the patient characteristics, because the scope of this project could not accommodate a medical review or claims-based analysis of the physicians' caseload. Our findings may therefore not be generalizable to the universe of physicians who treat patients with diabetes.

Conclusions

There is still considerable work to be done to align the ADA guidelines with current reimbursement levels for these services. Physicians compensate for low reimbursement levels in a variety of ways, including spending less time with each patient, seeing more patients each day, prioritizing the most important aspects of diabetes care on a given visit, and scheduling more follow-up appointments. Regardless of the tools used, policymakers need to consider how any change would affect the entire continuum of diabetes care. For example, although increasing the time that a PCP or endocrinologist spends with the patient would increase the cost for that particular visit, the extra time may translate to lower overall costs for the payer if the view posited by the panelists—more time with patients would lessen the need for repeat visits and referrals to other providers—holds true. Alternatively, it may make more clinical and financial sense for a nonphysician to provide some of the services (eg, MNT). Further research is needed to quantify how aligning reimbursement levels and the ADA guidelines will

improve diabetes care. This study provides exploratory qualitative findings supporting this endeavor. ■

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References

1. Kung HC, Hoyert DL, Xu JQ, Murphy SL. Deaths: final data for 2005. *Natl Vital Stat Rep.* 2008;56:1-120.
2. National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK). National Diabetes Statistics, 2007 fact sheet. Bethesda, MD: National Institutes of Health, 2008. <http://diabetes.niddk.nih.gov/dm/pubs/statistics/index.htm>. Accessed October 28, 2009.
3. American Diabetes Association. Economic costs of diabetes in the U.S. in 2007. *Diabetes Care.* 2008;31:1-20.
4. American Diabetes Association. Economic costs of diabetes in the U.S. in 2002. *Diabetes Care.* 2003;26:917-932.
5. Dall TM, Mann SE, Zhang Y, et al. Distinguishing the economic costs associated with type 1 and type 2 diabetes. *Popul Health Manage.* 2009;12:103-110.
6. Zhang Y, Dall TM, Mann SE, et al. The economic costs of undiagnosed diabetes. *Popul Health Manage.* 2009;12:95-101.
7. Zhang Y, Dall TM, Chen Y, et al. Medical cost associated with prediabetes. *Popul Health Manage.* 2009;12:157-163.
8. Chen Y, Quick WW, Yang W, et al. Cost of gestational diabetes mellitus in the United States in 2007. *Popul Health Manage.* 2009;12:165-174.
9. American Diabetes Association. Standards of medical care in diabetes—2008. *Diabetes Care.* 2008;31(suppl 1):S12-S54.
10. Funnell MM, Anderson RM. Patient empowerment: a look back, a look ahead. *Diabetes Educ.* 2003;29:454-458, 460, 462 passim.
11. Peel E, Douglas M, Lawton J. Self monitoring of blood glucose in type 2 diabetes: longitudinal qualitative study of patients' perspectives. *BMJ.* 2007;335:493. Epub 2007 Aug 30.
12. Lai WA, Chie WC, Lew-Ting CY. How diabetic patients' ideas of illness course affect non-adherent behaviour: a qualitative study. *Br J Gen Pract.* 2007;57:296-302.
13. Heisler M, Bouknight RR, Hayward RA, et al. The relative importance of physician communication, participatory decision making, and patient understanding in diabetes self-management. *J Gen Intern Med.* 2002;17:243-252.
14. Loveman E, Frampton GK, Clegg AJ. The clinical effectiveness of diabetes education models for type 2 diabetes: a systematic review. *Health Technol Assess.* 2008;12:1-116, iii.
15. Larme AC, Pugh JA. Evidence-based guidelines meet the real world: the case of diabetes care. *Diabetes Care.* 2001;24:1728-1733.
16. Leichter SB. Cost and reimbursement as determinants of the quality of diabetes care: 3. Reimbursement determinants. *Clin Diabetes.* 2002;20:43-44.
17. Williams AR, McDougall JC, Bruggeman SK, et al. Estimation of unreimbursed patient education costs at a large group practice. *J Contin Educ Health Prof.* 2004;24:12-19.
18. Novo Nordisk. NCDP Member Associates and Partners. www.ncdp.com/partners/overview.aspx. Accessed September 4, 2008.
19. Epocrates. Market research. www.epocrates.com/services/marketresearch/. Accessed September 4, 2008.
20. Panel Intelligence. Online panel discussions. <http://panelintelligence.com/online-panel-discussions.asp>. Accessed September 4, 2008.
21. Sokol MC, McGuigan KA, Verbrugge RR, Epstein RS. Impact of medication adherence on hospitalization risk and healthcare cost. *Med Care.* 2005;43:521-530.
22. Rhee MK, Slocum W, Ziemer DC, et al. Patient adherence improves glycemic control. *Diabetes Educ.* 2005;31:240-250.
23. Grey N, Maljanian R, Staff I, Cruzmarino de Aponte M. Improving care of diabetic patients through a collaborative care model. *Conn Med.* 2002;66:7-11.
24. Ho PM, Rumsfeld JS, Masoudi FA, et al. Effect of medication nonadherence on hospitalization and mortality among patients with diabetes mellitus. *Arch Intern Med.* 2006;166:1836-1841.
25. Zuckerman S, McFeeters J, Cunningham P, Nichols L. Changes in Medicaid physician fees, 1998-2003: implications for physician participation. *Health Aff (Millwood).* 2004;(suppl 4):W374-W384.
26. Moore KJ. Billing Medicare for diabetes self-management training. *Fam Pract Manage.* 1999;6:10.
27. Moore KJ. Billing Medicare for diabetes self-management training. *Fam Pract Manage.* 2001;8:14-15.
28. Deitrick L, Swavely D, Merkle LN, et al. Group medical visits for patients with type 2 diabetes: patient and physician perspectives. *Abstr AcademyHealth Meet.* 2005;22:Abstract 4077. <http://gateway.nlm.nih.gov/MeetingAbstracts/ma?f=103623540.html>. Accessed December 1, 2008.