

Frequent Outpatient Contact and Decreasing Medication Affordability in Patients With Diabetes From 1997 to 2004

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Despite significant changes in treatment standards for diabetes, there has been little improvement in overall rates of metabolic control (1–5). In recent years, diabetes medical regimen complexity has also increased markedly, with the proportion of U.S. patients taking five or more prescription medicines nearly doubling (from 18 to 30%) from 1994 to 2003 (6). Given the persistent difficulty in achieving ideal metabolic control and the increasing complexity of medical care, further insight into current diabetes outpatient management is required.

RESEARCH DESIGN AND METHODS

— We used data from the National Health Interview Survey (NHIS) to examine U.S. annual trends in diabetes care from 1997 to 2004. The NHIS is an annual nationwide in-person household survey conducted by the Census Bureau that includes an in-depth adult health care access and utilization survey. Sampled adults were asked about demographic and socioeconomic information, diagnosed conditions, self-reported ability to afford prescription medications in the prior year, perceived barriers to obtaining clinic appointments (e.g., long waits for appointments, difficulty making appointments, difficulty reaching the clinic by phone), and frequency of outpatient clinical contact (excluding overnight hospitalizations, telephone calls, and emergency room, dental, or home visits).

Response rates over this 8-year period varied from 80.8 to 90.3%.

We limited our analyses to adults who self-identified as having a diagnosis of nongestational diabetes. We created a single independent variable for year (numbered 1–8) and used logistic regression for dichotomous and linear regression for continuous dependent variables to examine time trends. All analyses were performed with SAS-callable SUDAAN software, version 7.5 (Research Triangle Institute, Research Triangle Park, NC) to obtain proper variance estimates while accounting for the complex sampling design. Sampling weights were adjusted for nonresponse and poststratification (e.g., age, race/ethnicity). This sampling design allows for estimates of national population rates and proportions for each year.

RESULTS — There were 17,039 respondents with diabetes between 1997 and 2004 (range 1,870–2,448/year). This weighted sample represents a U.S. population diagnosed with diabetes, which increased from just over 10 million patients in 1997 to over 15 million patients in 2004. Marked changes were seen in diabetes duration (from 11.3 years in 1997 to 14.1 years in 2004, $P < 0.001$), BMI (from 31.8 to 34.4 kg/m², $P < 0.001$), prevalence of insulin use (decreasing from 35.1 to 27.9%, $P < 0.001$), and prevalence of oral hypoglycemic use (increasing from 57.5 to 74.1%, $P < 0.001$) (Table 1). The mean patient age for each

annual cohort remained constant (59.3 years, $P = 0.74$).

Patients had a mean (\pm SD) of at least 7 ± 4.2 visits per year and a median of 6.5 (range 2.5–11.0) visits per year. By comparison, among all NHIS respondents aged 59–60 years without diabetes, annual visit rates during this same period were significantly lower (mean 4.3 ± 4.0 , median 2.5 [range 1–6.5], $P < 0.001$ for both comparisons). From 1997 to 2004, the proportion of respondents who reported problems affording prescription medications increased by one-third (from 10.9 to 14.8%, $P < 0.001$). In contrast, patients reported relatively low rates of perceived barriers to outpatient clinic visits (generally $<10\%$ and often $<5\%$). Self-reported medication cost barriers did not correlate with decreased access to outpatient care. Rather, patients who were less able to afford their medications were seen more frequently (7.33 ± 0.12 vs. 6.91 ± 0.04 visits/year, $P < 0.001$).

CONCLUSIONS — Patients with diabetes are seen frequently (an average of once every 7–8 weeks, with nearly one in five patients seen at least monthly) but are increasingly unable to afford their prescriptions. By 2004, nearly 15% of respondents (corresponding to 2.2 million U.S. patients with diabetes) reported being unable to afford their medications, up from 10.9% in 1997. This trend of decreasing medication affordability occurred despite few differences over time in the proportion of patients within each general category of insurance coverage (e.g., private, Medicaid, Medicare, uninsured). Rising “out-of-pocket” medication expenses, even among patients with private insurance, may partially explain this finding (7).

Increased personal medication costs reduce medication adherence and worsen disease control (8–10). For nearly 15% of patients with diabetes in 2004, efforts by their providers to lower risk factor levels through medication adjustment may have been undermined by patients’ inability to afford their medications. Should this

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Abbreviations: NHIS, National Health Interview Survey.

A table elsewhere in this issue shows conventional and Système International (SI) units and conversion factors for many substances.

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Table 1—Population-adjusted characteristics of U.S. patients with diabetes, 1997–2004

	Survey year (respondents)								P value for trend
	1997	1998	1999	2000	2001	2002	2003	2004	
n	2,061	1,906	1,870	2,072	2,285	2,186	2,211	2,448	
Population	10,031,055	10,386,486	10,755,123	11,863,011	13,006,143	13,390,796	14,011,824	15,126,359	
Age (years)	59.5 ± 0.4	59.6 ± 0.4	59.2 ± 0.4	59.2 ± 0.4	59.0 ± 0.3	59.4 ± 0.4	59.8 ± 0.4	59.7 ± 0.3	0.74
Female (%)	54.9	53.2	52.7	50.2	50.6	49.0	50.1	50.2	<0.001
Race (%)									
White	77.2	77.5	76.8	76.5	77.2	78.1	80.4	78.6	0.22
Black	18.1	16.4	16.5	16.8	16.4	15.7	15.4	16.1	
Other	4.7	6.1	6.8	6.7	6.4	6.2	4.1	5.3	
Insurance status (%)									
Private	63.0	64.7	63.5	64.4	65.4	63.8	60.5	60.5	0.014
Medicaid	12.4	12.5	11.3	11.3	12.6	12.3	14.0	12.1	0.32
Medicare	44.7	43.2	43.1	44.0	43.2	41.7	43.9	43.7	0.68
None	2.9	2.6	3.6	2.9	2.4	3.1	2.9	2.9	0.94
High school or less (%)	67.7	65.0	62.2	63.2	64.1	61.5	56.2	58.5	<0.001
Diabetes duration (years)	11.3 ± 0.3	11.1 ± 0.3	12.6 ± 0.4	13.2 ± 0.4	13.0 ± 0.4	13.3 ± 0.4	13.2 ± 0.4	14.1 ± 0.5	<0.001
Current smoker (%)	17.9	18.7	16.8	18.0	18.1	16.8	17.5	14.7	0.015
BMI (kg/m ²)	31.8 ± 0.4	32.1 ± 0.4	32.2 ± 0.4	32.9 ± 0.4	33.7 ± 0.4	34.5 ± 0.4	34.3 ± 0.4	34.4 ± 0.4	<0.001
Office visits in the prior year	6.99 ± 0.1	7.31 ± 0.11	7.34 ± 0.11	6.81 ± 0.11	6.78 ± 0.11	6.69 ± 0.10	7.23 ± 0.10	6.69 ± 0.10	0.0012
Insulin use (%)	35.1	31.7	33.6	33.7	28.0	27.5	28.9	27.9	<0.001
Oral medications (%)	57.5	61.5	61.7	65.1	68.2	69.7	69.4	71.4	<0.001
Cannot afford medication prescriptions (%)	10.9	8.2	10.9	10.8	11.3	13.1	12.2	14.8	<0.001

Data are means ± SD unless otherwise indicated.

trend continue, clinicians can expect even greater futility in their attempts to achieve diabetes goals, particularly since up to one-third of patients with financial problems never tell their physicians about their cost-saving underuse of medication (11).

We also found that patients with diabetes were significantly more obese in later years (an increase of 2.6 kg/m² in BMI over the 8-year period, which corresponds to 15–17 lb for people between 5'4" and 5'8"). This finding confirms other recent reports of the increasing obesity epidemic in the U.S. (12) and worldwide (13). Because obesity worsens insulin resistance (14) and is itself associated with cardiovascular disease (15), the inability to stem this concurrent epidemic of obesity may represent another increasing barrier to effective diabetes control.

There are several limitations of this study that must be addressed. All data are derived from patient self-report (albeit in face-to-face home interviews with trained interviewers), which may introduce some misclassification error (16). In addition, we were unable to distinguish between type 1 and type 2 diabetes, which may have important implications related to changing trends in insulin use. Finally, differences in screening practices over time (and the possibility of increased

screening among obese patients) may have resulted in changes in diabetes severity that were not directly assessed by this national patient survey.

We conclude that while most U.S. patients with diabetes have frequent and convenient access to their physicians, medication costs borne by patients represent an increasingly critical barrier to achieving optimal care. Given the critical role of medications in preventing costly diabetes complications, failure to effectively deal with this problem at a national policy level will likely have a significant negative impact on the future prevalence of diabetes-related complications. Although our data do not provide evidence for whether the current physician visit frequency is appropriate, the fact that we have multiple opportunities to affect the care of our patients over the course of each year, and yet continue to fall short of evidence-based management goals, also suggests that researchers, policy makers, and other innovators rigorously evaluate new strategies for diabetes care.

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