The Case for “Outsourcing” Diabetes Care

MAYER B. DAVIDSON, MD

Diabetes has a profound effect on the health of our population as well as on our economy. Diabetic retinopathy is the leading cause of blindness in people between 20 and 74 years of age (1). Diabetic nephropathy is the leading cause of patients undergoing dialysis for end-stage renal disease (2). Diabetic peripheral neuropathy is the underlying cause of nontraumatic lower-extremity amputations in diabetic patients (3). More than half of lower-extremity amputations occur in people with diabetes (4) who at that time constituted only 4.5% of the population (5). The prevalence of coronary artery disease is twofold higher in men with diabetes and fourfold higher in women with diabetes compared with appropriate nondiabetic control subjects (6). Strokes are two to three times more common in people with diabetes than in those without the disease (7). Peripheral vascular disease is also much more common in diabetic patients compared with nondiabetic individuals (8).

The total cost of caring for people with diabetes in this country in 1992 (106 billion dollars) represented 15% of the total health care budget (720 billion dollars) (5). In a more recent study, the American Diabetes Association (ADA) study found that in 1997 the specific (direct) costs for diabetes care was 44 billion dollars with another 54 billion dollars lost to the economy through indirect costs (i.e., short- and long-term disability and losses secondary to premature mortality) (9). Medicare spent 26.5% of its budget on diabetic patients (5). The excess costs for diabetes in Kaiser-Permanente in Northern California amounted to $3,494 per patient per year (10). Much of these increased costs for diabetes were for related complications. There were progressively increasing costs associated with worsening diabetic control in patients with either diabetes alone or with hypertension and heart disease (11). Increased glycated hemoglobin levels predicted higher rates of hospitalizations (12), which, of course, translates into higher costs in patients with poorer control. Large increases in costs (13–15) and decreases in productivity (15,16), mostly due to diabetic complications, continue to persist in patients with diabetes compared with people without diabetes.

The ADA has promulgated evidence-based guidelines (Table 1) that, if met, would have a major impact on reducing the devastation of diabetic complications. For instance, there is irrefutable evidence that near euglycemia will delay, blunt, and possibly prevent the microvascular and neuropathic complications of both type 1 (17–19) and type 2 (20,21) diabetes. Lowering of LDL cholesterol in diabetic patients markedly decreased both coronary events and the mortality due to these events (22,23). Independent of any effect on blood pressure, treatment of microalbuminuria (incipient diabetic nephropathy) (24–29) and clinical proteinuria (overt diabetic nephropathy) (30) with ACE inhibitors slowed the progression of renal disease.

Sadly, these process (frequency of test measurements and examinations or taking appropriate preventive medications) and outcome measures (attaining appropriate quantitative goals) are seldom achieved. Studies in both type 1 (17–19) and type 2 (20,21) diabetic patients show that the development and progression of retinopathy and nephropathy markedly increased with A1C levels >8%, increased moderately at A1C levels between 7 and 8%, and increased only slightly or not at all at A1C levels <7%. In an earlier review, the average glycated hemoglobin level in 4,449 patients followed in health maintenance organization (HMO) settings was 9.5 and 9.6% in 3,140 patients seen in fee-for-service settings (31). Furthermore, the easier-to-meet process measures fell far short (31) of the ADA guidelines that were in force at the time of the review. Subsequent studies (32–48) in over 13,000 diabetic patients published after the 1997 review (31) revealed a decrease in the average A1C level to 8.6%—but, still far above the ADA goal of <7.0%. One-quarter to one-third of patients still have A1C levels >9.5% (37,38,49,50). Only 3% of diabetic patients met the combined ADA goals for glycemia, lipids, and blood pressure at urban academic medical centers (51). Carrying out the process measures (41,43,45,47,50,52–57) also remains far below the ADA guidelines.

In the April issue of Diabetes Care, Taylor et al. (58) report on the effect of specially trained nurses interacting with patients (both face-to-face and via telephone) for establishment of individual goals, diabetes education, management of medications, and self-care activities. The patients selected for this intervention had an A1C level of >10% plus one or more comorbid conditions. After 1 year, A1C levels had fallen by 1.14% compared with a decrease of 0.35% in a comparable control group receiving usual care. Significantly more patients (43%) under nurse-directed care met an A1C goal of <7.5% than those in usual care (25%). Decreases in total and LDL cholesterol were also significantly greater in the intervention group.

These results confirm several other studies in which diabetic patients receiving nurse-directed (34,44,59–62) or, in one case, pharmacist-directed (63) care fared better than appropriate control patients followed in their usual medical care system. In these studies, the nurses (or pharmacists) were actively managing the patients’ diabetes care (under the super-
Table 1—Current ADA guidelines

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Goal</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. HbA1c</td>
<td>every 6 months if goal attained; every 3 months if greater</td>
</tr>
<tr>
<td>2. LDL cholesterol</td>
<td>yearly or more often as necessary</td>
</tr>
<tr>
<td>3. Triglycerides</td>
<td>yearly or more often as necessary</td>
</tr>
<tr>
<td>4. Renal profile—yearly or more often as necessary</td>
<td>(1) if ≥1+ positive and confirmed, ACE inhibitor unless contraindicated; serum creatinine every 6 months; (2) if dipstick negative or trace, evaluation for microalbuminuria; (a) if positive and confirmed, ACE inhibitor unless contraindicated.</td>
</tr>
<tr>
<td>5. Blood pressure—minimum every 6 months (or more often as necessary) as long as target level of ≤130/80 mmHg met.</td>
<td></td>
</tr>
<tr>
<td>6. Visits—minimum every 6 months as long as all action required levels not exceeded and all target levels met; otherwise a contact at least every 3 months.</td>
<td></td>
</tr>
<tr>
<td>7. Eye exam—yearly dilated funduscopic exam in all diabetic patients except type 1 patients within 5 years of diagnosis.</td>
<td></td>
</tr>
<tr>
<td>8. Foot examinations—minimum every 6 months or more often as necessary.</td>
<td></td>
</tr>
<tr>
<td>9. Weight—minimum every 6 months.</td>
<td></td>
</tr>
<tr>
<td>10. Smoking assessment—yearly; if current smoker, counseling or referral for cessation.</td>
<td></td>
</tr>
<tr>
<td>11. Aspirin (75–325 mg/day) in patients &gt;30 years of age with macrovascular disease or one or more cardiovascular risk factors (unless contraindicated).</td>
<td></td>
</tr>
</tbody>
</table>

*The National Cholesterol Education Program (NCEP) suggests considering treatment for triglyceride concentrations >200 mg/dl if the non-HDL cholesterol is >130 mg/dl.

Two studies evaluated whether feedback of information (not in real time) to physicians might improve diabetes outcomes. In the Diabetes Care Project involving Medicare patients (68), education of physicians and feedback of the A1C status of their patients resulted in a modest reduction of 0.7 percentage points. In a Kaiser setting (69), information on individual patients was fed back to chiefs of departments and endocrinologists. Two years later, less than 50% of the diabetic patients were meeting the glycemic, lipid, and renal process measures.

Two studies provided the physician via a computer (in real time) the standards of care that remained to be met for that patient at the time of the visit. Despite the fact that the unmet standards of care were provided to the physician at the patient visit, these process measures were carried out only one-third of the time (70). In the other study (57), the process measures that appeared on the computer were carried out from only 13 to 26% of the time.

In three studies, physicians were intensively educated (36,71,72), underwent repeated audits (71) and feedback of their results (71,72), were provided case management by a pharmacist (who could not change medications) (72), and had access by Internet or phone to an endocrinologist for specific patient questions (72). A1C levels remained unchanged (71,72) or fell modestly by 0.7 percentage points (36). Carrying out process measures to meet the standards of care remained below 50% (71).

A number of barriers to the adoption and implementation of new scientific findings to patient care have been identified (73). These include 1) health care provider knowledge; 2) communication between patient and health care provider; 3) attitudes and beliefs of the patient, community/culture, health care provider, and health care system; 4) racial and ethnic disparities; 5) variations in settings, including the health care system; 6) clinical traditions; 7) socioeconomic status; and 8) cost. It is perhaps not surprising that nurses (34,44,59–62) and pharmacists (63) who follow protocols and are supervised by physicians are able to improve diabetes care, because 1) the protocols by definition (since they are formulated by knowledgeable physicians) represent enhanced provider knowledge; 2) nurses are usually able to communicate better with patients because they are more
likely to be in tune with the attitudes and beliefs of patients and their community and culture; and, most importantly, 3) they have more time to devote to diabetes care since not only are they not directly responsible for other patient problems as is the physician, but also they usually don’t have to see as many patients per unit of time.

Diabetes care is different from most other types of medical care in that it is mostly preventive. Meeting the ADA guidelines will go a long way toward, if not preventing, at least delaying the complications of diabetes. Education is an important part of this preventive care, a time-consuming task for which physicians are usually ill-suited. Our medical care system is geared toward diagnosing and treating acute problems. Diabetes, which is mostly asymptomatic until the complications develop clinically, gets short shrift from the busy practitioner who usually also has to deal with other, more immediate problems in the diabetic patient. Nurses, or other “health promoters,” specially trained in diabetes, following agreed upon protocols and algorithms, under the supervision of a physician, can effectively concentrate on providing diabetes care that has a much better chance of meeting the evidence-based ADA guidelines than the harried physician left to his or her own devices.

There are at least five challenges to this “outsourcing” of diabetes care. First, the diabetic population is so large that there are not enough nurses either currently trained or potentially trainable to care for diabetic patients on an ongoing basis. One approach to this problem would be to have the person with diabetes under the care of the nurse for a limited time (~6 months) until either the ADA guidelines were met or the patient was given a realistic chance to meet them. At that point, the patient would be returned back to their primary physician with suggestions of how to intensify therapy in the future when (certainly in the person with type 2 diabetes) it becomes necessary. Giving the patient the ability to track their diabetes care is unlikely to accomplish this. “Outsourcing” diabetes care to specially trained nurses following agreed upon protocols and algorithms under the supervision of physicians has been proven to lead to better outcomes and should reduce morbidity and costs. A recent survey (77) found that preventive care is increasingly being delivered by nonphysician clinicians. Since diabetes care is mostly preventive, even though management decisions concerning medications are an important component, “outsourcing” it to nurses would simply follow the national trend.

References

5. Rubin R, Altman WM, Mendelson DN: Health care expenditures for people with


17. The Diabetes Control and Complications Trial Research Group: The relationship of glycemic exposure (Hba1c) to the risk of development and progression of retinopathy in the diabetes control and complications trial. Diabetes 44:968–983, 1995


61. Lorenzi GM, for the Medical Type 2 Program: Case management improves glycemic control in California subsidized health care system: final results (Abstract). *Diabetes* 50 (Suppl. 2):A36, 2001
62. Lawrence GM, for the Medical Type 2 Program: Case management improves glycemic control in California subsidized health care system: final results (Abstract). *Diabetes* 50 (Suppl. 2):A36, 2001