

# Economic and Clinical Impact of Innovative Pharmacy Benefit Designs in the Management of Diabetes Pharmacotherapy

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**D** iabetes has enormous personal, economic, and societal costs. The annual healthcare expenses related to diabetes in the United States are extremely high, with an estimated cost of \$132 billion in 2002. This figure is likely underestimated, because undiagnosed cases of diabetes were not included in the assessment. The care of diabetes-associated chronic complications alone costs \$24.6 billion each year. Overall, more than \$1 of every \$10 spent in the United States on healthcare is attributable to diabetes.<sup>1</sup>

## Financial Implications of Diabetes

Indirect expenses account for approximately \$40 billion of the annual cost of diabetes.<sup>1</sup> These expenses, which include lost productivity, early mortality, and permanent disability, are notoriously difficult to assess. Lost productivity, in particular, can be very difficult to measure, particularly in cases where the individual comes to work but is functioning at a diminished level. Although hard to quantify, these costs are likely to take a heavy toll on employers. Therefore, by reducing both direct and indirect diabetes-related costs, improved glycemic control can bring about significant savings.<sup>2</sup>

In a 3-year prospective study, Gilmer and colleagues showed that higher glycosylated hemoglobin (A1C) is associated with higher costs.<sup>3</sup> A typical health plan member with a baseline A1C of 10% incurred \$26 408 in total medical costs over 3 years. This was 11% higher than the costs (\$23 873) incurred by a member with a baseline A1C of 6% (Figure 1).<sup>3</sup> Additionally, in a retrospective database analysis by Shetty and colleagues, improved glycemic control was shown to be associated with short-term savings.<sup>4</sup> They found that the annual related costs for patients with sustained glycemic control (ie, A1C ≤ 7%) are 32% lower (\$1171) than the costs for patients who are not at the targeted A1C level (\$1540 per patient).<sup>4</sup>

Despite proven financial and clinical benefits of tight glycemic control, there remain a number of barriers to improved outcomes. Among the most important of these are adherence of healthcare professionals to practice guideline recommendations and adherence of patients to both lifestyle modification and pharmacotherapy. In a systematic

## Abstract

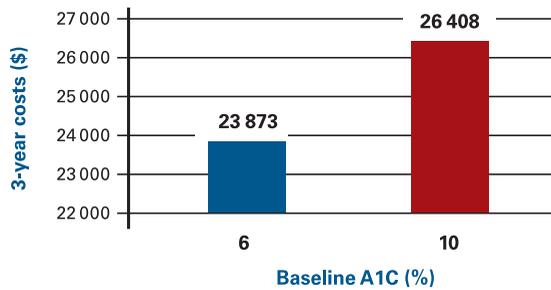
Diabetes has enormous personal, economic, and societal costs. Despite the proven financial and clinical benefits of tight glycemic control, there remain a number of barriers to improving outcomes, including poor adherence to pharmacotherapy, which is responsible for inadequate control of diabetes and the associated financial burden. There are many factors that may affect an individual's adherence to a medication regimen, such as personal beliefs, the complexity of the regimen, and, most importantly, cost.

Many benefit plans are affected by the rising cost incurred by its members, which could be potentially resolved if benefit plans think of innovative ways to promote adherence. One such example can be found in the benefit design chosen by Pitney Bowes. Their pharmacy benefit design contained diabetes medications in tier 1, which were under tier 2 in the past. Findings showed that as patient adherence increases with time, associated healthcare costs and annual pharmacy costs decrease.

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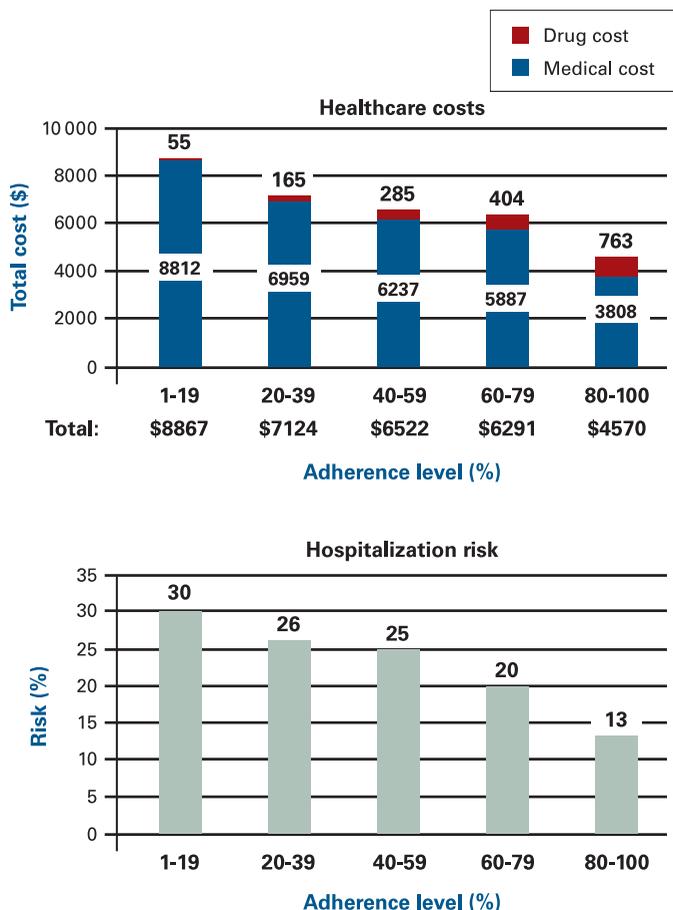
■ **Figure 1.** Impact of A1C Levels on Cost



A1C indicates glycosylated hemoglobin.

review of medication adherence, Cramer reported that adherence to oral antihyperglycemic agents in patients with type 2 diabetes ranged from 36% to 93%.<sup>5</sup> Rates of persistence for 12 months were lower, ranging from 16% to 58%. A recent retrospective study of adults with type 2 diabetes who were enrolled in an employer-sponsored health insurance plan found that 10.5% of patients failed

■ **Figure 2.** Impact of Medication Adherence on Disease-related Healthcare Costs and Hospitalization Risk



to fill a second prescription for antihyperglycemic medications, and 37% of patients had discontinued pharmacotherapy at 12 months. In the time interval during which prescriptions were being filled, 6.2% of patients were nonadherent, based on a medication possession ratio of less than 80%.<sup>6</sup> Depression may further complicate this problem, because depressed patients with type 2 diabetes have significantly lower adherence to oral hypoglycemic agents than nondepressed patients.<sup>7</sup>

Adherence is critical to treatment success and has a measurable impact on glycemic control and clinical outcomes in patients with diabetes.<sup>8,9</sup> It has been shown that patients with diagnosed diabetes not receiving pharmacologic treatment have significantly increased healthcare resource utilization.<sup>2,9</sup> Among those patients treated with antidiabetic agents, medication adherence is correlated with reduced overall healthcare costs, particularly with reductions in hospitalization rates (Figure 2).<sup>10</sup> These findings suggest that encouraging adherence could have a significant impact on diabetes complications and costs.

### Optimizing Healthcare Through Changes in Pharmacy Benefits

In 2000, Pitney Bowes became concerned with the high costs of healthcare when per-employee claims increased by 13% compared with 3% in similar companies. This increase prompted them to reexamine the cost drivers for several chronic diseases and to assess ways in which the management of key chronic conditions could be improved.<sup>11</sup> Some of the factors that influence the development of healthy, productive employees are shown in Figure 3. Both corporate values that encourage a healthy environment and personal responsibility are required to achieve this outcome.

*Understanding the Issues.* The first step taken by Pitney Bowes was to assess and measure the situation. The company had 23 000 employees; 58% were men, and the average age was 41 years.<sup>11</sup> About 80% of employees participated in a self-insured medical benefit plan, whereas the other 20% were in a fully-insured plan. Approximately 90% of all employees were covered by a common pharmaceutical plan. Pitney Bowes also offered an Internet-based health portal for employees, a wellness program, and a voluntary disease management program.<sup>11</sup>

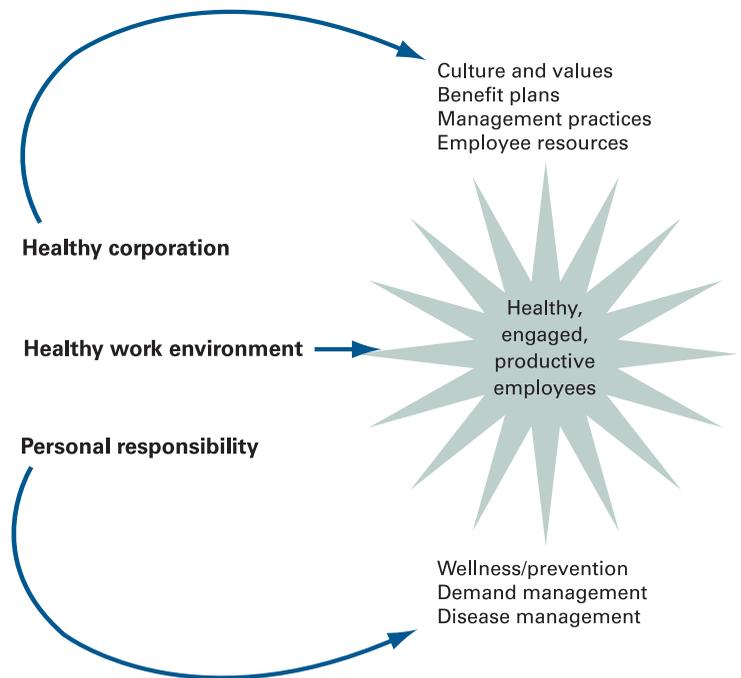
Pitney Bowes commissioned an analysis to identify population-based risk factors associated with high-cost health benefit utilization (>\$10 000) per year. A major conclusion of this analysis was that disease burden and costs were associated with a lack of adherence to pharmacotherapy. For example, patients with diabetes with 9 or fewer 30-day prescription refills for diabetic medications during the year were more likely to enter the high-cost group. Similar observations were made for other chronic conditions, including asthma and hypertension.<sup>11</sup>

**Modifying Pharmacy Benefits.** Before this analysis, Pitney Bowes utilized a standard 3-tier drug benefit plan, in which generic drugs had a 10% coinsurance payment, preferred drugs had a 30% coinsurance payment, and nonpreferred brand name drugs required a 50% coinsurance payment. On the basis of their findings on the impact of poor medication adherence, Pitney Bowes radically redesigned this tiered structure to remove possible financial impediments to medication availability for people with chronic conditions. In the new system, all medications for asthma, diabetes, and hypertension were moved to tier 1 with 10% coinsurance. Antidiabetic drugs that were affected by this change included several insulin analogs, glimepiride, pioglitazone, rosiglitazone, and single-pill combination oral therapies. Blood glucose testing supplies were also moved to tier 1.<sup>11</sup>

**Results in Patients with Diabetes.** For the typical plan participant with diabetes, the average cost of a 30-day prescription decreased by 50%. For many participants, drug costs were reduced by 80%, reflecting the difference between a 50% coinsurance payment and a 10% payment.<sup>11</sup>

Outcome assessments indicated that rates of adherence to diabetes medications increased significantly in response to the change in pharmacy benefits. Suboptimal adherence to insulin therapy decreased by two thirds, and usage of blood glucose meter test strips increased from 28% to 55%. The percentage of members adhering to single-pill combination oral antidiabetic agents showed particularly impressive increases, with usage of this group of drugs increasing from 9% to 22%.<sup>11</sup>

■ **Figure 3. Factors That Contribute to Healthy, Productive Employees**



In response to this shift, the company’s total annual pharmacy costs per person increased slightly, from about \$26 per month to \$35 per month. However, pharmacy costs for individuals with diabetes actually decreased by 7%.<sup>11</sup>

Diabetes-related emergency department visit rates also decreased, as did diabetes-associated disability (Table). Overall, the average annual increase in employee health cost from 2000 to 2003 at Pitney Bowes was 8.1% compared with increases of 12% to 15% for benchmark companies (Caremark, unpublished data, 2006).

**Small Changes Can Have a Big Impact**

The Pitney Bowes experience provides strong evidence that fairly small changes in pharmacy ben-

■ **Table. Short-term Disability (STD) Data in Pitney Bowes Employees With Diabetes Who Participated in Self-insured Medical Plans (~750 employees)**

	2002	2003	2004
Active STD cases per 100 employees	0.06	0.07	0.03
Average duration per STD case (days)	58	30	41
Average cost per STD claimant (\$)	7798	2486	1925

efits can have a significant impact on overall healthcare costs. It also serves as an example of how creativity must be utilized to address ongoing healthcare issues. The increasing prevalence of diabetes—specifically, type 2 diabetes—its attendant high direct and indirect costs, and the challenges associated with getting patients to more aggressive A1C goals, make it imperative to use a combination of approaches, including a renewed effort to reach treatment goals, the use of performance measures to assess diabetes management, novel diabetic therapies, and innovative pharmacy benefit approaches to promote adherence. Without innovative new approaches to healthcare management, costs are likely to escalate, and the financial and social burden of chronic conditions and their complications will continue to increase.

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