

Evaluating the Impact of a Pharmacist-Care Program for Persons with Diabetes

Prepared for:
National Community Pharmacists Association Foundation

by:

David Nau, R.Ph., Ph.D.
Assistant Professor

Josh Blevins
Graduate Student

Department of Pharmaceutical Systems & Policy
West Virginia University

March 1, 2000

Executive Summary

We evaluated the utility of paying independent community pharmacists to monitor persons with Type 2 Diabetes for glycemic control, hypertension, and hyperlipidemia. We also examined patients' perceptions of the services and estimated the costs of the monitoring program. Additionally, we discuss the value of pharmacist compensation for providing this service.

This project was conducted in collaboration with the Ohio Valley Pharmacist Care Network (OVPCN). The community pharmacists in this network provided baseline data from 47 patients that were enrolled in the OVPCN diabetes care program. The majority of the patients were members of a local HMO from which the pharmacists were able to obtain compensation for their services. The pharmacists also distributed a survey to their patients to gain feedback on the program, and provided estimates of their costs for implementing the diabetes care program.

We found that the pharmacists were able to identify a substantial number of persons with Type 2 diabetes who were **not** achieving the therapeutic goals for HbA1c (63.9%), blood pressure (55.3%), LDL (76.5%) or weight (61.9% were obese). None of these patients were newly diagnosed with diabetes. Almost all of the patients had been diagnosed with diabetes for over one year.

The results of the survey revealed that patients strongly agreed that because of the pharmacists' diabetes care program, they better understood diabetes and their medications, they more frequently checked their blood glucose, and their diabetes was better controlled. They also felt that their physicians supported the program, that their health insurance should pay for the program, and that they would recommend the program to other persons with diabetes. However, there was a mixed response from the patients as to whether they would continue participation if their health insurance no longer covered the diabetes care program.

Finally, we estimated that to replicate the OVPCN diabetes care program for 30 patients, the initial investment for a typical community pharmacist may be close to \$7,700. Although compensation for pharmacist-based disease management services varies greatly amongst payers, we recommend that pharmacists seek payment that covers not only their initial investment but also a reasonable fee for their time. The increasing trend is for pharmacists to charge \$60-\$90 per hour for their services, plus a fee for laboratory tests. In the case of OVPCN, the pharmacists' contract with the local HMO provides barely enough compensation to cover the pharmacists' initial investment.

Poor control of Type 2 diabetes and its typical co-morbidities may lead to blindness, end-stage renal disease, amputations, heart attack or stroke. All of these complications are very costly to the health care system. Community pharmacists are capable of implementing diabetes care services that can identify many patients who are not reaching the desired therapeutic endpoints. By working with the patients and their physicians, the pharmacists can help to enhance the clinical, humanistic and economic outcomes of care for persons with diabetes. These services can be of great value to third-party payers who are seeking to optimize care while controlling costs.

Background

The treatment of persons with diabetes is often expensive and inadequate. In 1992, 14.2% of direct health care expenditures were used to treat patients with diabetes who represent less than 5% of the population.¹ This represents an average annual expenditures on medical care for persons with diabetes of \$9,493 compared to \$2,604 for patients in general. Many of these costs are associated with the management of the complications of uncontrolled diabetes. For example, diabetes is the leading cause of end-stage renal disease (ESRD). Without specific intervention, over ten years, 50% of Type 1 diabetics (the figure jumps to more than 75% over 20 years) and 20-40% of Type 2 diabetics will develop overt nephropathy.² The costs of treating ESRD have been estimated at \$53,659 per year.³

The costs of other micro- and macrovascular complications can be very high as well. The costs of treating an acute myocardial infarction in a Type 2 diabetic is estimated at \$27,630 for the first year followed by \$2,185 per year thereafter.³ The same study estimated the costs of ischemic stroke in this population to be \$40,616 in the first year. The costs of treating proliferative retinopathy and macular edema were estimated at \$1,044 and \$1,100 respectively.

However, the American Diabetes Association (ADA) estimates that the complications of diabetes could be reduced dramatically if patients maintained adequate control of their diabetes. Results from the Diabetes Control and Complications Trial (DCCT) suggest that intensive treatment and monitoring could reduce the risk of retinopathy (76%), nephropathy (50%), neuropathy (60%), hypercholesterolemia (34%) and cardiovascular disease (41%).

To decrease the risk of diabetic complications, the ADA recommends that patients receive annual assessments of cholesterol, triglycerides and microalbumin, and that glycosylated hemoglobin (HbA_{1c}) be measured two to four times per year depending upon the patient's glycemic control. Numerous studies have shown that these assessments are frequently not done. A recent study of Medicare claims from three states found that only 16% of Medicare diabetics received at least one HbA_{1c} test over the course of one year, 46% saw an ophthalmologist and 55% were screened for high cholesterol.⁴ Managed care organizations tend to fare better than fee-for-service providers, but are far from meeting the ADA guidelines. One major HMO in California

reported HbA_{1c} tests were done for 44% of its patients with diabetes and United HealthCare Corporation recently reported rates of about 60% for HbA_{1c} testing in its enrollees.^{5,6}

As part of HEDIS 2000, the National Committee on Quality Assurance (NCQA) currently requires managed care organizations to track key indicators regarding the quality of care for persons with diabetes. The frequency of glycosylated hemoglobin and lipid tests for this population are two of the diabetes indicators. Hence, managed care organizations need mechanisms to continuously improve their performance in monitoring the care provided to their members with diabetes. Pharmacists could potentially increase the percentage of persons who receive these tests by conducting the assessments in the pharmacy. Equipment to conduct these assessments are CLIA-waived in most states and many pharmacists are starting to use them.

Increasingly, healthcare organizations are using pharmacists or nurses to assist in the monitoring and management of patients with diabetes. The VA Medical Center in Pittsburgh is one of several VA clinics that use specially-trained pharmacists to educate and monitor diabetics. A recent review of their services found that the Type 2 diabetics who were enrolled in the pharmacist-based program experienced significant improvements in glycemic control within six months.⁷ After adjusting for the costs of the program, they estimated that the net savings to the VA Medical Center for 15 of their most severe diabetics was over \$103,000 per year. Reports from several community pharmacist diabetes programs have also demonstrated significant improvements in glycemic control and cost reductions.^{8,9,10}

The Ohio Valley Pharmacist Care Network Diabetes Program

Mission

The mission of the diabetes care program is to enhance patients ● health-related quality of life and optimize their utilization of health care resources. This will be accomplished by 1) in-depth education of patients on their diabetes treatment plan, 2) optimization of drug utilization; 3) intensive monitoring of the patients ● progress towards desired therapeutic targets, and 4) an increased flow of patient-specific information between pharmacists, physicians, patients and any other persons involved in the diabetes care system.

Program Goals for Type 2 Diabetes

1. Increase the % of patients with HbA_{1c} Ⓢ 8% (ideally < 7%).
2. Increase the % of patients with Fasting Blood Glucose (FBG) Ⓢ 140 mg/dl.
3. Increase % of patients with LDL Ⓢ 130mg/dl (ideally < 100mg/dl).
4. Increase % of patients whose blood pressure is Ⓢ 130/85 mmHg.
5. Decrease diabetes-related ER visits, hospitalizations and unscheduled MD visits.
6. Increase treatment guideline adherence (regular eye exams, foot exams, immunizations, microalbumin, HbA_{1c}, FBG, Lipids, BP, weight).
7. Enhance health-related quality of life.
8. Optimize the flow of information between patient, pharmacist and physician.

Pharmacist Services

Initial Assessment and Education

1. Collect baseline data: Weight, Blood Pressure, Blood Glucose, Lipid Panel, HbA_{1c}.
2. Assess Guideline Compliance: PCP visit, Eye/Foot Exams, Immunizations.
3. Perform review of medication regimen and patient adherence to regimen.
4. Patient Education (3 sessions of 1 hour each).
5. Forward documentation and recommendations to Primary Care Physician.

Scheduled Follow-up (every 3 months)

1. Collect monitoring data: Weight, Blood Pressure, Blood Glucose diary.
 - A. Lipid panel and microalbumin testing on an annual basis.
 - B. HbA_{1c} testing every 3 months if HbA_{1c} Ⓢ 8%, otherwise every 6 months.
2. Assess Guideline Compliance: PCP visit, Eye/Foot Exam, Immunizations.
3. Re-evaluate medication regimen and patient adherence.
4. Re-educate patient if necessary
5. Forward documentation to Primary Care Physician.

Pharmacist Qualifications

Every member of the Ohio Valley Pharmacist Care Network must meet the following standards:

- A. Must be a registered pharmacist.
- B. Must have completed an approved certification program in diabetes-related pharmaceutical care from a national organization. Currently approved programs include: APhA, NIPCO, or AADE Comprehensive Review Program.
- C. Must have completed the West Virginia University certificate program in Pharmaceutical Care for Persons with Diabetes.
- D. Must possess and be trained in the proper use of the following instruments:
DCA 2000 (HbA_{1c}), Cholestech LDX or equivalent (lipid profiles),
Blood Pressure monitoring equipment, glucose meters.
- E. Must have obtained CLIA waivers for all equipment requiring this waiver.
- F. Must demonstrate competence in using the OVPCN diabetes education materials.
- G. Must have a private area to meet with patients.
- H. Must maintain appropriate patient care records.

Current Members of OVPCN

Pharmacists

Location

JJ Bernabei, R.Ph.
Aldo Crisante, R.Ph.

Follansbee Pharmacy, Follansbee, WV

Roger Cole, R.Ph.
Adele Storm, R.Ph.

Medicine Shoppe, Moundsville, WV

Bob Gelner, R.Ph.

Medicine Shoppe, Elm Grove, WV

Joe Jefferies, R.Ph.

Riesbecks, St. Clairsville, OH

Michael Kacsmar, R.Ph.

Riesbecks, Shadyside, OH

Methods

Research Goals

The program evaluation will determine whether the pharmacist's assessment of his/her patients with Type 2 diabetes is of significant value to patients, physicians and payers. Consequently, this study will focus on the initial patient assessment conducted by the pharmacist, and will examine patients' perceptions of the pharmacists' educational services. The following research questions will be addressed:

1. What percentage of adults with Type 2 diabetes will be identified by the pharmacist as having:
 - a) poor glycemic control as evidenced by a HbA1c \geq 8%?
 - b) uncontrolled hypertension as evidenced by a blood pressure \geq 130/85 mmHg?
 - c) uncontrolled dyslipidemia as evidenced by a fasting LDL \geq 100 mg/dl?
2. What are patients' perceptions of the pharmacist-based program?
3. What concerns or suggestions do patients express regarding the program?
4. What are the direct and indirect costs of the pharmacist care program and what is the appropriate compensation for the program.

Study Population

Adults with Type 2 diabetes were eligible for inclusion. It was anticipated that the majority of participants would be members of The Health Plan of the Upper Ohio Valley since this HMO is paying for the educational component of the pharmacists' services. However, the assessments were offered to all patients with Type 2 diabetes who attended the OVPCN pharmacies.

Clinical data collection

The clinical data was be collected and recorded by the pharmacists as part of their standard care program. The HbA1c levels are determined by analyzing blood samples in the Bayer DCA2000+ machine. These tests can be performed in the pharmacy by trained personnel. The HbA1c reagent cartridge requires only 1 microliter of blood from a fingerstick and takes only 5 minutes to obtain results.

The lipid profile is conducted through the use of the Cholestech LDX analyzer using a fingerstick sample of blood. This test provides estimates of the total cholesterol, HDL, LDL and triglyceride and glucose levels. All samples were drawn from patients in a fasting state.

The pharmacists also monitor the patient's blood pressure at each visit. Two blood pressure readings were taken with the patient in the sitting position over the course of the assessment visit. The mean of the two blood pressures was used for analyses.

The body mass index for each patient was estimated using the height and weight in the following formula: $(\text{pounds} \times 703) / (\text{inches} \times \text{inches})$. Thus, a 200 pound, 72 inch person would have a BMI of $(200 \times 703) / (72 \times 72) = 27.1$.

Patients' Perceptions of Diabetes Care Services

The patients' perceptions of the pharmacist-provided diabetes education and monitoring services were collected via a written questionnaire (Appendix 1). This questionnaire was mailed to the patients by the pharmacist, along with a cover letter and return envelope. The patients received the survey in January, 2000 which may have been 3-6 months after the patient had initially enrolled in the program. In all cases, the patient had completed a basic assessment and education session with the pharmacist. Some patients had at least one follow-up visit at the time of the survey.

Implementation Cost Estimates and Revenues

The costs of implementing the diabetes care program were estimated by each of the OVPCN pharmacists. They provided written and verbal estimates to the principal investigator (Dr. Nau) for all costs that they felt were incurred in establishing the program. Dr. Nau compiled the estimates to create a composite of the implementation costs (Appendix 2). This was reviewed by the pharmacists who felt it was an accurate estimate of the costs for re-creating the OVPCN diabetes care program.

The estimated revenue was based on both the current reimbursement received by OVPCN pharmacists, as well as the recommended reimbursement based on the pharmacists receiving \$60 per hour for their education and assessment services, plus the standard reimbursement for the HbA1c and lipid tests. Reimbursement for the lab tests was based on the most common fee paid by a local HMO for these tests.

Results

Patient Characteristics

The pharmacists enrolled 54 patients in the clinical program, of which 32 (59%) were female. The average age of the participants was approximately 60 years (range: 35 to 81 years).

Clinical Assessment

Usable clinical data was obtained for 47 patients. The baseline assessment revealed that a considerable number of persons were not “at goal” for the clinical indicators (Table 1). For HbA1c, 63.9% of persons had not reached the desired goal of HbA1c=7%, and over one-third were above HbA1c=8%. Blood pressure was also elevated for about half of the patients, with only 44.7% reaching the ADA recommended target of 130/85mmHg. Approximately 15% could be categorized as having Stage 2 or 3 hypertension.

Lipid levels were also not ideal for many of the patients. Twenty-seven patients (57.4%) were not achieving an LDL <130mg/dl, and 76.5% did not meet the therapeutic goal of LDL < 100mg/dl. Triglycerides were also elevated in 57.4% of patients.

The body mass index (BMI) was also calculated based upon the height and weight of each patient. Approximately 85.7% of persons were over an ideal BMI of 25, and nearly 62% were obese (BMI > 30).

Patient Perceptions of Pharmacy Services

Twenty-six of the 54 patients returned the questionnaire mailed to them by the pharmacists. The respondents generally perceived the pharmacists’ services as having a positive impact on their life. Patients strongly agreed that because of the pharmacists’ diabetes care program, they better understood diabetes and their medications, they more frequently checked their blood glucose, and their diabetes was better controlled. They also felt that their physicians supported the program, that their health insurance should pay for the program, and that they would recommend the program to other persons with diabetes. However, there was a mixed response from the patients as to whether they would continue participation if their health insurance no longer covered the diabetes care program.

Estimated Costs of Implementation

The estimated costs of implementing a diabetes care services similar to that provided by the Ohio Valley Pharmacists Care Network (OVPCN) are provided in Appendix 2. It is important to note the assumptions that were used in creating the cost estimates. The scope of the pharmacist care services will dictate the costs of implementation as well as the appropriate compensation.

Increasingly, pharmacists are charging (and being paid) for their time as well as product costs. A common hourly rate for pharmacist care services is \$60 per hour. This is in addition to laboratory charges. If the pharmacists were to only do the baseline assessment and education, they would likely spend approximately 2-3 hours (average of 2.5 hours for \$150) with the patient and perform 1 HbA1c (\$16) and 1 lipid profile (\$35). Thus, the appropriate pharmacist charge for the baseline assessment and education service would be \$201. The OVPCN pharmacists currently receive \$125 for this service.

The OVPCN pharmacists also conduct quarterly follow-up visits with the patients. They receive \$35 per visit for these patients and no additional reimbursement for the laboratory tests. Each of these visits lasts approximately 30 minutes for a total of 2 hours per year for followup. Based on the approximate number of hours (4.5hr) that the OVPCN pharmacists spend with the patients each year and the number of lab tests that would be performed for each patient over the course of one year (2 HbA1c and 1 lipid profile), the recommended fee for this type of pharmacist care program is \$337 per patient per year. This exceeds the current reimbursement received by these pharmacists (\$265/pt/yr).

Discussion

For persons with diabetes, glycemic control is an important predictor of micro- and macrovascular complications (cite DCCT/UKPDS). Additionally, blood pressure and lipid levels are important markers for cardiovascular mortality (citation). The American Diabetes Association recommends frequent monitoring of HbA1c, blood pressure and lipids to help ensure that patients are maintaining control of their condition. Regular eye, foot and renal screenings are also recommended.

In this study, a novel approach was used to identify persons with diabetes who were not reaching the recommended therapeutic goals for HbA1c, lipids, and blood pressure, as well as to identify persons who may benefit from weight management programs. Community pharmacists collected information on their patients with diabetes, and sent reports to each patient's physician. The pharmacists were able to identify a substantial number of persons who were not reaching the desired endpoints of therapy, and helped the physicians make appropriate adjustments to the drug regimen. The patients and many of the physicians were quite appreciative of the pharmacists' efforts.

Achieving control of diabetes is challenging. Behavioral changes in diet, exercise and medication use are difficult to maintain, and patients often experience decline in their glycemic control over time. Consequently, close monitoring is essential and having a supportive pharmacist can be of great help in maintaining control of not only diabetes, but of blood pressure, lipids, and other conditions too. Pharmaceutical care, or pharmacist care, espouses a closer relationship between patient, pharmacist and physician. It is essential that all three participants in this relationship understand the goals for disease control, that they agree on a plan for monitoring, and that information flows smoothly between the participants to continually enhance the patient's health.

Pharmacists are in an excellent position to not only provide information about drug therapy, but to also assess the patient's progress toward to the therapeutic goal. In this study, the pharmacists identified 36.2% of their patients as having an HbA1c above 8%. The ADA suggests that an HbA1c above 8% should prompt additional action by the providers to enhance the patient's glycemic control.¹¹ The pharmacists were able to notify the physicians that these patients were not "at goal" and suggested specific therapeutic options. Although the long-term impact of these recommendations could not be assessed at this time, identifying the patients in need of additional help

prevented over one-third of the patients from “slipping through the cracks” and having their uncontrolled diabetes go unnoticed.

Many patients with Type 2 diabetes also have hypertension and/or hyperlipidemia. Many patients with diabetes die of macrovascular complications such as heart attack or stroke.³ Thus, it is important to monitor blood pressure and lipid levels in persons with diabetes. The pharmacists in this network identified over half (55.3%) of the patients as not meeting the ADA recommend blood pressure goal of 130/85 mmHg. Additionally, about 15% of the patients had blood pressure readings that were consistent with Stage 2-3 Hypertension. Thus, at least 15% and perhaps as many as 55% of the patients could benefit from additional intervention.

The pharmacists also found that 69.8% of patients had not reached the ADA recommended goal of LDL-c <100mg/dl. The LDL-c level is an important indicator of risk for cardiovascular mortality.¹² Over 76% of patients also had HDL levels below the recommended target, and 57.4% had elevated triglycerides. This seems consistent with the finding that 85.7% of patients were above their ideal body weight and about 62% of patients were considered obese. Clearly, many of the patients enrolled in the pharmacy-based program were in need of help in reducing their risk of macrovascular complications.

The twenty-six patients who returned the pharmacists' questionnaire were generally quite positive about the diabetes care program. They felt that their diabetes was better controlled as a result of the pharmacists' help, and that their physician supported their involvement in the program. They also believe quite strongly that their insurance should pay for these services. However, there were quite a few people who indicated that they would not personally be willing to pay for these services. The pharmacists also found that when offering the program to their patients, there were many who were interested in the program, but few who were willing to pay “out-of-pocket” for the services. They may not perceive that the pharmacist could have a significant impact on their ability to manage their diabetes. Thus, until patients or payers see the value in these services, there is unlikely to be significant demand for them.

Pharmacists' involvement with diabetes care is not a new concept. An increasing number of certified diabetes educators are pharmacists, and several studies have demonstrated the impact of a pharmacist's care on diabetes outcomes.^{7,8,9,10} However,

very few community pharmacists have conducted assessments of their diabetic patients that are as comprehensive as the program described here. In addition to examining blood glucose meter readings, weight and blood pressure, the pharmacists in this network used CLIA-waived equipment to collect HbA1c and lipid information within the pharmacy. Performing these tests while the patient was in the pharmacy allowed the pharmacist to give the patient immediate feedback on their disease control, and facilitated more timely modifications of drug therapy. Rather than the pharmacist waiting for the physician to order the test, and then hoping that the patient would go to the laboratory and that the physician would share the data and make appropriate changes in drug therapy, the pharmacist can more proactively identify problem areas and make informed, specific recommendations for drug therapy enhancement.

Having the pharmacist collect and report this information can be in the best interest of physicians and health plans. If physicians can rely on the pharmacist to coordinate the education and monitoring functions for diabetes care, then the physicians may be able to save time and be more efficient in their care for diabetes. The pharmacist can perform the key monitoring tests recommended by the American Diabetes Association and provide reports directly to the physician along with recommendations for drug therapy modification. Additionally, the pharmacist can ensure that the patients are seeing their physician on a regular basis and can promote positive health behaviors (e.g., regular eye and dental exams, flu shots, smoking cessation). By enhancing the frequency of regular exams and monitoring tests (e.g., HbA1c), a pharmacist can assist health plans in improving their diabetes indicator scores for the Health Plan Employer Data and Information Set (HEDIS). Although an individual pharmacy may have little impact on the overall HEDIS score of a health plan, a network of pharmacies may be able to produce a measurable difference.

The costs of implementing the diabetes care program within the Ohio Valley Pharmacist Care Network were substantial. The pharmacists spent approximately \$7,000 at each store to acquire the equipment, supplies and training necessary to provide this service. While this is not an insurmountable barrier to implementation, the compensation levels should be adjusted to offset these costs within an acceptable time frame. The pharmacists were able to offset some of these costs through small grants from pharmaceutical manufacturers and foundations, however contracts with third-party payers are currently the primary source of revenue.

Across the nation, the compensation for pharmacist care programs varies greatly as does the structure of pharmacy-based disease management services. Anecdotal reports lead us to believe that compensation ranges from \$0 to approximately \$800 per patient per year. In 1997, Fincham and Lofholm suggested that community pharmacists could reduce health expenditures for diabetes by \$4,295 per patient.⁸ A community pharmacy based saved the city of Asheville, North Carolina over \$900 per patient per year.⁹ Consequently, it appears that community pharmacists can produce savings to third-party payers and patients that clearly exceeds the pharmacists' compensation.

Limitations

It is important to note that the percentage of persons identified as not having reached the therapeutic goal was based upon the number of persons who agreed to participate in the pharmacist-based program. It is not clear whether the persons enrolled in this monitoring program were different from the general population of persons with diabetes. It is possible that the persons who agreed to participate were less healthy and thus saw more potential value in receiving help from the pharmacist. Conversely, it is also possible that the persons who refused participation were generally more recalcitrant and less likely to maintain good health behaviors and had poorer control of their disease. Very few persons declined participation in the program, hence we believe that the study population was fairly consistent with the general population of diabetics.

Conclusions

Community pharmacists can play an important role in diabetes care by identifying patients who are not achieving their therapeutic goals, and by working with physicians to make drug therapy modifications. Through identifying patients not "at goal," the pharmacists have the opportunity to prevent the development of diabetes-related complications and reduce total healthcare expenditures. Implementing a diabetes monitoring program may require a significant investment by a pharmacist, however this service should be of great value to patients, physicians and third-party payers.

References

1. Rubin RJ, Altman WM, Mendelson DN. Health care expenditures for people with diabetes mellitus, 1992. *Journal of Clinical Endocrinology and Metabolism* 1994;78:809A-809F.
2. American Diabetes Association. Position Statement: Diabetic Nephropathy. *Diabetes Care* 1997;20:S24-S27.
3. O'Brien JA, Shomphe LA, Kavanagh PL, et al. Direct medical costs of complications resulting from Type 2 Diabetes in the U.S. *Diabetes Care* 1998;21:1122-1128.
4. Weiner JP, Parente ST, Garnick DW, et al. Variation in office-based quality. *JAMA* 1995;273:1503-1508.
5. Peters AL, Legorreta AP, Ossorio RC, Davidson MB. Quality of outpatient care provided to diabetic patients. *Diabetes Care* 1996;19:601-606.
6. Burton TM. United HealthCare finds drugs, test are often underutilized. *The Wall Street Journal (Interactive Edition)* July 8, 1998.
7. Coast-Senior EA, Kroner BA, Kelley CL, Trilli LE. Management of patients with Type 2 diabetes by pharmacists in primary care clinics. *Annals of Pharmacotherapy* 1998;32:636-641.
8. Fincham JE, Lofholm PW. Saving Money and Lives – Pharmacist Care for Diabetes Patients. *America's Pharmacist* 1998;(March):49-52.
9. The Asheville Project. *Pharmacy Times* 1998(October supplement).
10. Berringer R, Shibley MCH, Cary CC, et al. Outcomes of a Community Pharmacy-Based Diabetes Monitoring Program. *Journal of the American Pharmaceutical Association*. 1999;39:791-7.
11. American Diabetes Association Standards of Medical Care for Persons With Diabetes Mellitus. *Diabetes Care* 2000;23(Supplement 1);S32-S42.
12. Summary of the Second Report of the National Cholesterol Education Program (NCEP) Expert Panel on Detection, Evaluation and Treatment of High Blood Cholesterol in Adults. *JAMA* 1993;269:3015-3023.

Table 1
Non-Achievement of Therapeutic Goals (N=47)

Indicator	% of patients
HbA1c: ^a	
7 - 8%	27.7%
> 8%	36.2%
Total above goal:	63.9%
Blood Pressure: ^{b,c}	
Stage 1 hypertension	31.9%
Stage 2 hypertension	8.5%
Stage 3 hypertension	6.4%
Total:	46.8%
Lipids:	
Total Cholesterol > 200	38.3%
LDL >100	69.8%
HDL < 45	76.5%
Triglycerides > 200	57.4%
Body Mass Index (BMI): ^d	
25-30	23.8%
> 30	61.9%

-
- a. The ADA recommends a target HbA1c of 7% for persons with diabetes, and that additional clinical action be taken for patients with an HbA1c over 8%.
 - b. The JNC-VI guidelines define hypertension using the following parameters:
 - Stage 1 = systolic \geq 140 or diastolic \geq 90
 - Stage 2 = systolic \geq 160 or diastolic \geq 100
 - Stage 3 = systolic \geq 180 or diastolic \geq 110
 - c. The ADA recommends a target blood pressure of 130/85mmHg, and 56.3% of patients failed to meet this goal.
 - d. The Body Mass Index was estimated using the height and weight of the individual as measured in the pharmacy. The recommended BMI is 20-25, and a BMI > 30 is considered obesity.

Table 2 - Results of Patient Survey (N=26)

Item	Mean  SD^a
1. Recommend program to others	4.70  0.47
2. Diabetes is better controlled	4.24  0.88
3. Check my blood sugar more often	4.42  0.70
4. Better understand diabetes	4.64  0.49
5. Better understand medications	4.42  0.65
6. Doctor supports this program	4.50  0.65
7. Health insurance should pay for program	4.64  0.57
8. If I had to pay, I would continue program	3.44  1.04
9. Pharmacist cares about me	4.69  0.47
10. Pharmacist knowledge about diabetes	4.77  0.43
11. Pharmacist looks out for my interests	4.81  0.40
12. Pharmacist gave too much info. on diabetes	2.13  1.23
13. Appointments were at convenient times	4.69  0.47
14. This program should continue	4.69  0.55

a. Responses were measured on a 5point agreement scale wherein higher scores indicate greater agreement.

