



The Asheville Project: Long-Term Clinical and Economic Outcomes of a Community Pharmacy Diabetes Care Program

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Objective: To assess the persistence of outcomes for up to 5 years following the initiation of community-based pharmaceutical care services (PCS) for patients with diabetes. **Design:** Quasi-experimental, longitudinal pre-post cohort study. **Setting:** Twelve community pharmacies in Asheville, N.C. **Patients and Other Participants:** Patients with diabetes covered by self-insured employers' health plans. Community pharmacists trained in a diabetes certificate program and reimbursed for PCS. **Interventions:** Education by certified diabetes educators, long-term community pharmacist follow-up using scheduled consultations, clinical assessment, goal setting, monitoring, and collaborative drug therapy management with physicians. **Main Outcome Measures:** Changes in glycosylated hemoglobin (A1c) and serum lipid concentrations and changes in diabetes-related and total medical utilization and costs over time. **Results:** Mean A1c decreased at all follow-ups, with more than 50% of patients demonstrating improvements at each time. The number of patients with optimal A1c values (< 7%) also increased at each follow-up. More than 50% showed improvements in lipid levels at every measurement. Multivariate logistic regressions suggested that patients with higher baseline A1c values or higher baseline costs were most likely to improve or have lower costs, respectively. Costs shifted from inpatient and outpatient physician services to prescriptions, which increased significantly at every follow-up. Total mean direct medical costs decreased by \$1,200 to \$1,872 per patient per year compared with baseline. Days of sick time decreased every year (1997–2001) for one employer group, with estimated increases in productivity estimated at \$18,000 annually. **Conclusion:** Patients with diabetes who received ongoing PCS maintained improvement in A1c over time, and employers experienced a decline in mean total direct medical costs.

Keywords: Asheville Project, pharmaceutical care, diabetes, quality of life, health care costs, health outcomes.

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Research has demonstrated that educational interventions by health care providers help patients with diabetes make the behavioral changes needed to improve glycemic control^{1,2} and that ade-

quate metabolic control reduces diabetes-related morbidity and mortality.³ However, a recent meta-analysis revealed that such improvements in glycemic control tend to decline within 3 months after the educational intervention ceases.² Because patients visit pharmacies more than any other health care setting,⁴ pharmacists are well placed to reinforce and maintain the effectiveness of such interventions through expanded pharmaceutical care services (PCS) to patients with diabetes. As PCS become more prevalent, interest in their long-term effectiveness is expected to increase as well. The study described here is unique in that it is the first to assess, for periods as long as 5 years, the clinical and economic outcomes of community pharmacy-based PCS in patients with diabetes.

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Objectives

This research was part of a larger study, the purpose of which was to assess the clinical, economic, and humanistic outcomes of