

The Value of Pharmaceutical Care Services

Lead author: Kim Palacios, Pharm.D., Assistant Editor

This table offers many examples of recent and past studies documenting the impact of pharmaceutical care on outcomes and health expenditures. Refer to *Detail-Document #151201* for a listing of those studies published before 1999.

Setting or Disease State	Results	Citation
Ambulatory Care Clinic	Clinical pharmacist interventions over a 12-month period improved patient care without increasing overall healthcare expenditures. Clinical pharmacist intervention improved the rate of HgA1c measurements and resulted in better cholesterol control for patients.	Carter BL, Malone DC, Billups SJ, et al. Interpreting the findings of the IMPROVE study. <i>Am J Health Syst Pharm</i> 2001;58(14):1330-7.
Ambulatory Care Clinic	Pharmacist intervention in a geriatric ambulatory clinic identified potential and actual drug-related problems, resulting in drug therapy changes. In 99.5% of cases, clinical outcome of changes in drug therapy were neutral or positive. Pharmacy services resulted in net savings of \$7,788 annually.	Blakey SA, Hixson-Wallace JA. Clinical and economic effects of pharmacy services in geriatric ambulatory clinic. <i>Pharmacotherapy</i> 2000;20(10):1198-203.
Anticoagulation	A pharmacist-run anticoagulation service in a community hospital showed a 57.9% decrease in hospitalization rates (p=0.078) and a 71.1% decrease in total hospital days (p=0.108) after six months compared to the patients' previous six months before enrollment.	Spalek VH, Gong WC. Pharmaceutical care in an integrated health system. <i>J Am Pharm Assoc</i> 1999;39:553-7.
Anticoagulation	A pharmacist-managed anticoagulation service significantly lowered total hospital costs compared to usual patient care (\$1,594 vs. \$2,014 in 1997 dollars, p=0.04). These services were also associated with an earlier start of warfarin (p=0.05) and shorter hospital stays (p=0.05).	Mamdani MM, et al. Clinical and economic effectiveness of an inpatient anticoagulation service. <i>Pharmacotherapy</i> 1999;19(9):1064-74.
Cholesterol	Pharmacists in a lipid clinic monitored lipid-lowering therapy and helped patients achieve their LDL goals. After 12 months, 77% of patients reached their LDL goals.	Cording MA, Engelbrecht-Zadvorny EB, Pettit BJ, et al. Development of a pharmacist-managed lipid clinic. <i>Ann Pharmacother</i> 2002;36:892-904.

More . . .

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Community/ Cholesterol	Community pharmacists, working collaboratively with other healthcare professionals, can successfully manage dyslipidemia. Over an average period of 24.6 months the observed rate for medication compliance was 90.1%. At the end of the project, 62.5% of patients had reached and maintained their lipid goal.	Bluml BM, McKenney JM, Cziraky MJ. Pharmaceutical care services and results in project ImPACT: hyperlipidemia. <i>J Am Pharm Assoc (Wash)</i> 2000;40(2):157-65.
Community/ Cholesterol	Community pharmacists effectively facilitated the identification of high-risk cholesterol patients. Pharmacists identified at-risk patients through point-of-care cholesterol measurement, provided education, and directly referred patients to their physicians.	Tsuyuki RT, Johnson JA Teo KK, et al. A randomized trial of the effect of community pharmacist intervention on cholesterol risk management. <i>Arch Intern Med.</i> 2002;162:1149-55.
Community	Pharmacists' cognitive services generated a mean drug cost savings of \$13.05 per intervention that resulted in a change of drug therapy. For the specific payment rate for cognitive services used in this study, paying for cognitive services is estimated to save an additional \$10 per 1,000 prescriptions. For interventions when drug therapy was added (9% occurrence), the estimated additional cost is \$13 per 1,000 prescriptions. Sensitivity analysis revealed that a higher intervention rate leads to even higher potential savings.	Smith DH, Fassett WE, Christensen DB. Washington State CARE project: downstream cost changes associated with the provision of cognitive services by pharmacists. <i>J Am Pharm Assoc</i> 1999;39:650-7.
Community/ Diabetes	Training community pharmacists to provide diabetes education, blood glucose meter training, clinical assessment, and patient monitoring resulted in improvements of HgA1c and lipid levels for participating patients. Total average direct medical costs decreased by \$1,200 to \$1,872 per patient per year. Patients experienced a reduction in sick time for one employer group, with estimated increases in productivity at \$18,000 annually.	Cranor CW, Bunting BA, Christensen DB. The Asheville Project: long-term clinical and economic outcomes of a community pharmacy diabetes care program. <i>J Am Pharm Assoc (Wash)</i> 2003;43(2):173-84.
Depression	Clinical pharmacy specialists, working collaboratively with primary care providers, improved patient compliance and reduced patient visits to primary care providers. Pharmacists comanaged medication use and provided follow-up contact for patients with mild to moderate depression.	Finley PR, Rens HR, Pont JT, et al. Impact of a collaborative pharmacy practice model on the treatment of depression in primary care. <i>Am J Health-Syst Pharm.</i> 2002;59:1518-26.

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Heart Failure	Involving a clinical pharmacist in the follow-up and monitoring of heart failure patients significantly lowered rates of mortality and heart failure events over a 6-month period (p=0.005). Patients in the intervention group received higher doses of angiotensin-converting enzyme inhibitors and were closer to their targeted dose. There was also a significant reduction in hospital readmission rates, 29% vs. 42% for control group (p=0.03).	Gattis WA, Hasselblad V, Whellan DJ, O'Connor CM. Reduction in heart failure events by the addition of a clinical pharmacist to the heart failure management team. <i>Arch Intern Med</i> 1999;159:1939-45.
HIV	Pharmacists' interventions in an HIV clinic improved patient compliance and patient care. 89% of pharmacist interventions were clinically significant and improved treatment efficacy by 62%.	Geletko SM, Poulakos MN. Pharmaceutical services in an HIV clinic. <i>Am J Health Syst Pharm</i> 2002;59(8):709-13.
Home Health Care	Pharmacists working with a home healthcare agency had a positive impact on patient care. Projects implemented included a drug information service, home vancomycin monitoring, a pain management program, evaluation of patients with CHF, and adverse drug reaction identification and reporting.	Triller DM, Hamilton RA, Briceland LL, et al. Home care pharmacy: extending clinical pharmacy services beyond infusion therapy. <i>Am J Health Syst Pharm</i> 2000;57(14):1326-31.
Hospital	Converting to decentralized pharmacy services increases clinical pharmacy interventions and decreases drug expenditures. After one month of decentralized services, interventions rose from 239 to 1,315. Monthly cost savings rose from \$21,300 to \$130,192.	Crowson K, Collette D, Dang M, Rittase N. Transformation of a pharmacy department: impact on pharmacist interventions, error prevention, and cost. <i>Jt Comm J Qual Improv</i> 2002;28(6):324-30.
Hospital	Over a 30-day period, six pharmacists at a large university hospital reduced drug costs by 41% using pharmaceutical care services (p=<0.001). This was estimated to equal annual savings of \$394,000.	McMullin ST, et al. A prospective, randomized trial to assess the cost impact of pharmacist-initiated interventions. <i>Arch Intern Med</i> 1999;159:2306-9.
Hospital	Both centrally-based and patient-specific clinical pharmacy services reduced hospital mortality rates. A decrease of up to 40,478 deaths a year was seen in over 1,000 hospitals that had the following clinical pharmacy services: clinical research, drug information, drug admission histories, and participation on a cardiopulmonary resuscitation team.	Bond CA, Raehl CL, Franke T. Clinical pharmacy services and hospital mortality rates. <i>Pharmacotherapy</i> 1999;19(5):556-64.

Setting or Disease State	Results	Citation
Hypertension	A pharmacist-managed hypertension clinic improves patients' blood pressure control. 81% of patients managed by pharmacists reached their BP goal compared to 30% of patients who received standard care from their physicians ($p < 0.0001$).	Vivian EM. Improving blood pressure control in a pharmacist-managed hypertension clinic. <i>Pharmacotherapy</i> 2002;22(12):1533-40.
Intensive Care Unit	Clinical pharmacy services in an intensive care setting reduces drug errors and adverse drug events, decreases morbidity and mortality rates, and improves overall healthcare costs. Pharmaceutical services provided include pharmacokinetic consultations, drug monitoring, drug information, and medical education to patients and healthcare professionals.	Papadopoulos J, Rebeck JA, Lober C, et al. The critical care pharmacist: an essential intensive care practitioner. <i>Pharmacotherapy</i> 2002;22(11):1484-8.
Intensive Care Unit	Including a pharmacist on rounds as a member of the patient care team in an intensive care unit was associated with a lower rate of adverse drug events (ADE) caused by prescribing errors. The rate of ADEs was decreased by 66% from 10.4 to 3.5 per 1,000 patient-days ($p < 0.001$). The pharmacist made 366 drug-ordering recommendations, of which 362 (99%) were accepted by the physicians.	Leape LL, et al. Pharmacist participation on physician rounds and adverse drug events in the intensive care unit. <i>JAMA</i> 1999;282(3):267-70.
Ulcers	A pharmacist-run enhanced compliance program (ECP) improves patient compliance with bismuth subsalicylate, metronidazole, and tetracycline hydrochloride (BMT) triple therapy for <i>H. pylori</i> infections. There was a statistical significance in the number of patients taking more than 90% of the medications between the ECP group and the control group ($p < 0.01$). Adequate results for triple therapy require good patient compliance.	Lee M, et al. A randomized controlled trial of an enhanced patient compliance program for <i>Helicobacter pylori</i> therapy. <i>Arch Intern Med</i> 1999;159(19):2312-6.

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