PCMH-General Clinical Pharmacy Programs:


  This landmark publication summarizes the findings of multiple published clinical trials evaluating the value of pharmacist provided patient care services in a team based environment. Considering the journal that it was published, it has had high impact. A total of 298 studies were included in this analysis and demonstrated that there were favorable results in therapeutic and safety outcomes related to several diseases with pharmacist provided direct patient care. In particular, A1c, LDL-cholesterol, and blood pressure were significantly reduced. Moreover, there was a significant reduction in adverse drug events; therefore, favoring pharmacists’ direct patient care over comparative services. Humanistic outcomes related to medication adherence, patient knowledge, and quality of life-general health were significantly better in patients provided pharmacists' direct patient care. This study serves as evidence globally demonstrating that pharmacist-provided direct patient care has many favorable effects and can be used to incorporate pharmacists as health care team members in direct patient care.


  The University of Michigan collaborated with Blue Cross Blue Shield of Michigan (BCBSM) to incorporate pharmacists into their patient centered medical home (PCMH) health care model at eight general medicine practices. These PCMH pharmacists assisted in managing chronic conditions by substituting or augmenting physician care, helped to achieve quality indicators, and increased revenue by billing for their services. Pharmacists provided direct patient care services at the eight general medicine health centers for patients with diabetes, hypertension, hyperlipidemia, and polypharmacy. These were billable paid to the University of Michigan by most of the BCBSM plans. Results demonstrated that in the first year, the number of PCMH pharmacist half-day clinics varied from one to six per health center, and the mean number of patients per half-day clinic was 2.2 to 6. There was some heterogeneity among the clinics as pharmacists in four PCMHs made more medication changes per visit than the other four, particularly for patients with diabetes. This publication serves as a successful example of how the University of Michigan partnered with a payer to implement pharmacists into the PCMH model to provide direct patient care services using a referral system from physicians.
Hypertension:


  This meta-analysis focused exclusively on published clinical trials evaluating the effect of pharmacist interventions on blood pressure. Though one of the purposes was to identify potential determinants of heterogeneity among the different trials included, this publication provides an excellent summary of the 39 individual randomized controlled trials that were included (n=14,224). The various pharmacist interventions included patient education, feedback to physician, and medication management. Compared with usual care, pharmacist interventions showed significantly greater reduction in systolic and diastolic blood pressure values. This analysis indicated that greater reductions in blood pressure were seen if the intervention by the pharmacist and was done at least monthly.


  The CAPTION study was a prospective, cluster-randomized trial evaluated a physician/pharmacist collaborative model to improved blood pressure control in primary care medical offices. 32 primary care offices in the United States were randomized to: control, a 9-month brief intervention, or a 24-month sustained intervention. A total of 625 patients with uncontrolled hypertension were enrolled. Of note, 54% of the patients were from racial/ethnic minority groups. Blood pressure control at 9 months was 43% in intervention offices compared to 34% in the control group (P=0.059). The adjusted difference in mean systolic/diastolic blood pressure between the intervention and control groups for all subjects at 9 months was −6.1/−2.9 mm Hg (p =0.002 and p=0.005, respectively), and was −6.4/−2.9 mm Hg (p=0.009 and p=0.044, respectively) in subjects from racial or ethnic minorities. BP control and mean BP were significantly improved in subjects from racial minorities in intervention offices at 18 and 24 months (p=0.048 to p<0.001) compared to the control group. These findings suggest that team-based care utilizing clinical pharmacists was effective in lowering blood pressure among a diverse primary care population.


  This was a substudy of the CAPTION study evaluating patients with treatment-resistant hypertension. At baseline, 169 of the CAPTION patients (27% of the total population) had treatment-resistant hypertension (similar to resistant hypertension). After 9 months, the adjusted mean systolic blood pressure was reduced by 7 mm Hg more with the physician-pharmacist collaborative model intervention compared with usual care (P=0.036). These findings suggest that team-based models of care that utilize a pharmacist in the primary care setting may be effective for patient's treatment resistant, or resistant, hypertension.

This clinic-based randomized trial determine whether an intervention combining home blood pressure telemonitoring with pharmacist case management improves blood pressure control compared with usual. 450 adults with uncontrolled hypertension across 16 primary care clinics in an integrated health system in Minnesota were enrolled in this study. Intervention patients received home blood pressure telemeters and transmitted data to pharmacists who adjusted antihypertensive therapy accordingly. Blood pressure was controlled at both 6 and 12 months in 57.2% of Telemonitoring Intervention patients and 30.0% of Usual Care patients (P=0.001). Additionally, at 18 months blood pressure was controlled in 71.8% of Telemonitoring Intervention patients and 57.1% of Usual Care patients (P=0.003). This study demonstrates that the model of home telemonitoring and pharmacist case management was successful in achieving better blood pressure control compared to usual care during 12 months of intervention, and benefits persisted for 6 months post-intervention.


This clinical trial studied the impact of pharmacist prescribing on blood pressure control in community-dwelling patients. This randomized, controlled trial, enrolled adults with uncontrolled hypertension in community pharmacies, hospitals, or primary care clinics in Alberta, Canada. Intervention group patients received an assessment of blood pressure and cardiovascular risk, education on hypertension, prescribing of antihypertensive medications, laboratory monitoring, and monthly follow-up visits for 6 months. These were all provided by a pharmacist. Control group patients received a wallet card for recording blood pressure, written hypertension information, and usual care from their pharmacist and physician. 248 patients (mean age 64 years) were enrolled in this study. After 6 months, systolic blood pressure was reduced 18.3 mm Hg in the intervention group compared to 11.8 mm Hg in the control group (P=0.0006). The adjusted odds of patients achieving BP targets was 2.32 (95% CI, 1.17-4.15) in favor of the intervention group. Pharmacist prescribing for patients with hypertension resulted in a clinically important and statistically significant reduction in BP. This study was conducted in Canada, where pharmacists have less required training what is required in the United States yet may have extended privileges related to prescribing. However, these data justify expanded role for pharmacists, including prescribing, to control hypertension.
Diabetes:


  This systematic review and meta-analysis assess the effect of pharmacist interventions on glycemic control in type 2 diabetic patients. A total of 30 randomized controlled trials were included in the systematic review and 22 in the meta-analysis. Most of these trials were conducted in the United States in ambulatory patients using face-to-face contact only. In comparison with usual care, pharmacist interventions were associated with significant 8.5% relative reduction in A1c values. These findings confirm that pharmacist interventions improve glycemic control in patients with type 2 diabetes compared with usual care.


  This was a systematic review and meta-analysis of 15 randomized controlled trials that assessed the effect of pharmacist care on cardiovascular disease risk factors among patients with diabetes. A total of 9,111 ambulatory patients were included in which interventions were conducted exclusively by pharmacists. Pharmacist interventions included medication management, educational interventions, feedback to physicians, measurement of cardiovascular disease risk factors, or patient-reminder systems. Compared with usual care, pharmacist care was associated with significant reductions in blood pressure, LDL-cholesterol, and body mass index. This meta-analysis provides data that pharmacist interventions, both alone or in collaboration with other health care professionals, improve major cardiovascular disease risk factors among outpatients with diabetes.


  This prospective, multicenter, cohort study evaluated the effect of a pharmacist-physician collaboration on attainment of diabetes-related measures of control. Patients with type 2 diabetes from 7 practice sites throughout Tennessee were enrolled and followed for 12 months. Practices included private clinics, academic health-systems, and a Veterans Affairs Medical Center. Of the 206 patients enrolled (mean age 59.7 years), A1c was reduced by an average of 1.16% (p < 0.0001). The proportion of patients with A1c < 7% increased from 12.8% at baseline to 36.8% (p = 0.0002). The proportion of patients with A1c > 9% decreased from 34.2% to 16.5%, (p < 0.0001). These benefits were achieved without increasing the total number of antihyperglycemic agents prescribed and without an increase in patient-reported episodes of hypoglycemia.

This retrospective analysis included 147 adults with type 2 diabetes whose care was managed by a team of providers including a pharmacist and a matched sample of 147 patients managed by a primary care physician only. All patients received services through the same health maintenance organization. During the 12-month study period, the mean A1c values decreased from 9.5% to 6.9% in the group that included a pharmacist and from 9.3% to 8.4% in the control group (p < 0.001). Patients in the group that included a pharmacist were significantly more likely to attain goals for A1c, LDL-cholesterol, and blood pressure, and three times more likely to attain all three goals. These data provide support that the addition of a pharmacist to a health maintenance organization primary care team improve clinical parameters in patients with type 2 diabetes.