# Clinical pharmacists supporting patients with diabetes and/or hyperlipidemia in a military medical home

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## Abstract

***Objective***: To evaluate the effect of clinical pharmacists embedded in primary care at a military facility by reviewing laboratory assessments following pharmacist management of referred patients with diabetes and hyperlipidemia.

***Methods***: Electronic medical records of patients who were referred to clinical pharmacists for control of diabetes and/or hyperlipidemia were reviewed for those with at least two encounters during a 6-month period with baseline and follow-up laboratory assessments. As appropriate to patient diagnoses, glycosylated hemoglobin (A1C), low density lipoprotein cholesterol (LDL-C), triglycerides (TGs), and body mass index (BMI) were included in assessments. Paired *t* tests were used to determine the statistical significance of mean changes between the beginning and end of the 6-month period.

***Results***: In the cohort of patients with diabetes (n = 46), mean A1C decrease over 6 months was 0.9 points ($P$ = 0.004). In the cohort of patients with hyperlipidemia (n = 15), mean LDL-C decrease was 20 mg/dL ($P$ = 0.004). Changes in mean LDL-C, TGs, and BMIs were observed in each group but were not statistically significant.

***Conclusion***: Although small sample sizes limited statistical power in this analysis, results suggest that referral of ambulatory patients to a clinical pharmacist in a military medical home for diabetes and/or hyperlipidemia improved care management.


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The benefit of pharmacists in patient care clinics is being explored in a growing number of populations. The Asheville Project[1] evaluated hypertension and dyslipidemia education and medication therapy management by pharmacists. Patients' use of medications improved, and this may have contributed to reductions in mean blood pressures, serum low density lipoprotein (LDL) cholesterol, serum triglycerides (TGs), and total serum cholesterol. Patients' emergency department visits and hospitalizations decreased, as did mean expenditures for medical costs.[1]

The American Pharmacists Association (APhA) Foundation's conducted the Diabetes Ten City Challenge in 10 communities across the United States with the goals of changing the management and financing of chronic diseases and in general to demonstrate the broad scalability of the Asheville model.[2] In this intervention-based program, patients with diabetes who had two or more visits with pharmacists were monitored over time. The cohort receiving pharmacists' patient care services showed improvements in glycosylated hemoglobin (A1C) and LDL cholesterol. Mean total health care costs decreased.[2] A survey showed that 97.5% of patients receiving interventions were satisfied or very satisfied with pharmacist patient care services.[3] Satisfaction may be an important determinant for whether patients adhere to pharmacist recommendations.

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In addition to these projects,[1,2] one military-related study demonstrated improvement in A1C levels among patients with diabetes who were referred to a clinical pharmacist.[4] This study cohort of older men veterans, however, may be considered less diverse than other military populations.

Navy Medicine has a model of care called the medical home port (MHP), which is synonymous with the patient-centered medical home (PCMH). In February 2012, the MHP at our facility incorporated a clinical pharmacist in the family medicine and internal medicine clinics. The addition of a clinical pharmacist to the MHP team was intended to support the model principles of care coordination, quality and safety, access to care, as well as supporting providers' management and improving outcomes.

At our facility, a patient with a chronic medical condition may be referred to a clinical pharmacist on the MHP team to optimize control. Alternative reasons for referral may include transition of care, high-risk or complex medication regimens, cardiac risk assessment, and poor patient adherence to medications. In the MHP, clinical pharmacists are available to take immediate questions from providers, assist with drug selection and dosing, provide education and counseling, and conduct direct medication therapy management for complex conditions. In this facility, pharmacists are credentialed providers and are able to prescribe medications without a physician's signature.

## Objectives

This study evaluated the impact of clinical pharmacists in the MHP teams at a Navy military treatment facility where control of challenging conditions is a basis for pharmacist referral.

## Methods

We conducted a retrospective cohort study through review of electronic medical records, including outpatient care notes, prescribed medications, and laboratory test values. Records were included for analyses if patients were at least 18 years of age; were referred to the clinical pharmacist to support diabetes or hyperlipidemia treatment; received care between February 1, 2012, and August 31, 2012; and had at least two individual encounters with a pharmacist.

Absence of laboratory data within the defined time periods was a criterion for exclusion. Although some patients designated as having hyperlipidemia had symptoms of diabetes noted in their records, patients were not designated as having diabetes unless they were referred to the clinical pharmacist to specifically control diabetes.

Changes in LDL cholesterol levels, TG levels, and body mass index (BMI) between baseline and 6-month follow-up for all referred patients with diabetes and/or hyperlipidemia were evaluated. Changes in A1C values in patients with diabetes were also evaluated. Baseline laboratory test results were defined as those associated with the first encounter after February 1, 2012 (range –30 to +10 days) and 6-month follow-up laboratory test results ranged from 147 to 271 days after baseline. As a secondary outcome, the amount of time (in minutes) pharmacists spent with patients during each individual patient care visit was documented.

In this cohort, some patients were newly referred to the clinic while others were receiving ongoing care of this type. A subanalysis was performed of newly referred patients with diabetes whose first encounter with the clinical pharmacist was after February 1, 2012.

Paired *t* tests were applied to evaluate statistical significance of changes in mean values of the laboratory parameters. The level of significance was set at 0.05.

The study was approved as by the Navy Regional Institutional Review Board (NHCP.2013.0003), and all appropriate procedures were followed for the protection of patient data.

## Results

Pharmacists provided direct patient care services to 132 patients during the 6-month period whose records were evaluated for inclusion in the study. For the primary outcomes in the group with diabetes, 46 patients met the inclusion criteria with laboratory follow-up at 6 months (147–264 days). For the primary outcomes in the group with hyperlipidemia, 15 patients met the inclusion criteria of laboratory follow-up at 6 months (152–271 days).

Characteristics of these patients are shown in Table 1. Most patients were middle-aged adults with a variety of comorbid conditions. The mean starting values for LDL cholesterol and A1C were 94 mg/dL and 8.3%, respectively, in patients with diabetes.

Laboratory value changes after approximately 6 months of follow-up are listed in Table 2. Among patients with diabetes, mean changes in A1C, LDL cholesterol, and TGs showed improvement (decreases in value), but mean BMI increased. Statistical significance was observed only for changes in A1C. Among patients with hyperlipidemia, mean changes in LDL cholesterol and TGs showed improvement (decreases in value), but average BMI increased. Statistical significance was observed only for changes in LDL cholesterol.

Patients with diabetes had a mean of 3.8 encounters (range 1–11) with a clinical pharmacist during the 6-month span, and these lasted a mean of 154 minutes per patient (range 45–415). Patients with hyperlipidemia had a mean of 2.9 encounters (range 1–8) with a clinical pharmacist during the 6-month span, and these lasted a mean of 116 minutes per patient (range 45–270).

A subanalysis was performed on 16 patients who were considered newly referred for diabetes support. Among this group, A1C improved in 14 of 16 (88%) patients, with a mean reduction of 2.4 percentage points