Pharmacists’ role in hypertension management

The role of pharmacists in hypertension and its management was first addressed by The Translator in the Fall 2009 edition.1 Since then, robust evidence has been published to describe the health benefits of pharmacist intervention. The pharmacy profession has experienced a transformation through both expanded scope and a higher level of patient trust in pharmacists’ ability to manage their chronic diseases. At the same time, the magnitude of the health risk related to hypertension has garnered significant media attention, and it is now realized that close to 22% of Canadians adults (aged 20 to 79 years) have elevated blood pressure.2 Furthermore, only 64% of this population has controlled hypertension (on hypertensive medication and blood pressure under 140/90 mmHg).3 By improving blood pressure control, patients may achieve visible results such as an increased overall health and a decreased risk of other associated health concerns including heart disease, stroke and ultimately, death.

Pharmacists can have a significant role in monitoring blood pressure and managing the medication of patients with hypertension. As one of the most easily accessible health care professionals, pharmacists have the necessary tools and knowledge to implement timely screening and effective prevention initiatives. Those with prescriptive authority can modify antihypertensive regimens to better personalize a patient’s treatment. Actively involved in hypertension research, pharmacists also play an important role in updating and publishing annual evidence-based guidelines. Recognizing pharmacists as key members of hypertension management opens the door to increasing their involvement in several additional chronic health conditions. In this issue of The Translator, four studies support the role of pharmacists’ active intervention in the area of hypertension.

Pharmacists’ active prescribing leads to improved blood pressure and lipid values in stroke/TIA patients


Issue: Optimal management of hypertension and dyslipidemia is the cornerstone in the secondary prevention of ischemic stroke. A 10 mm Hg drop in systolic blood pressure (SBP) results in a 41% decrease in stroke events.1 Furthermore, the decrease of low-density lipoprotein (LDL) cholesterol by statins adds additional benefit in stroke survivors.2 Despite hospitalization and stroke prevention clinics, modifiable vascular risk factors are not well controlled in stroke survivors.3 The traditional screening and educational approach employed by case managers requires reassessment, and active pharmacist intervention is another avenue to evaluate.

A solution: According to a recent Cochrane review, stroke survivors may benefit from close monitoring and case management from nurses or pharmacists.4 This study compares two management methods over six months: pharmacist active prescribing versus nurse screening and feedback to physicians. Nurse case management (active intervention control
Pharmacists’ active prescribing leads to improved blood pressure and lipid values in stroke/TIA patients (cont.)

- Background or research methods: For this 6-month prospective, randomized control trial, 279 subjects from three stroke prevention clinics in Edmonton were randomly assigned to the pharmacist-led group (intervention) or nurse-led group (active control). After an initial visit with each study subject, the attending neurologist delegated management to the subject’s family physician. For six months, the subjects returned monthly to the clinic to be seen by a nurse or pharmacist.

- Implications: Pharmacists and nurses play an important case management role in the secondary prevention of stroke. In addition to traditional screening and educational services offered by nurses, pharmacists’ initiation or titration of antihypertensive and/or antidysslipidemic medication results in significantly greater improvement of vascular risk factors in stroke survivors. This study provides high quality evidence for the added value of prescriptive services offered by pharmacists over and above that of usual chronic disease management strategies.

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A home blood pressure monitoring system uses pharmacists and a web-enabled program to control hypertension


**Issue:** Despite the 76 million US adults who suffer from hypertension, over half have uncontrolled blood pressure (BP), demonstrating the necessity of adjusting current treatment strategies. Uncontrolled hypertension can contribute to other serious health concerns including acute myocardial infarction, stroke, kidney failure and congestive heart failure. A key issue within hypertension treatment strategies is difficulty in separating patients only slightly outside their target ranges from those who are radically uncontrolled. With the increasing prevalence of hypertension, reforms in hypertension management are necessary to prolong lives and ultimately decrease hypertension’s burden on the health care system, resources and associated costs.

**A solution:** Patient home blood pressure monitoring (HBPM), in conjunction with provider interventions, may improve hypertension control rates. The American Heart Association developed a program to complement current health care methods called Heart360 (www.heart360.org). Heart360.org is a free web application to help patients understand and track their cardiovascular risk. It monitors BP levels, physical activity, cholesterol, glucose, weight and medications. Patients can upload home BP readings from their BP device into Heart360.org, track their progress and receive additional educational information for decreasing their cardiovascular risk. Heart360 incorporates patient involvement and provides feedback on their progress, encouraging continuous improvement. Heart360 graphics allow patients to view their progress and seek medical attention only if their readings begin to exceed their target BP range. Pharmacists, as medication experts, have in-depth knowledge and experience pertaining to medication therapy management. Heart360’s report summaries can allow pharmacists to collaborate with physicians to provide innovative antihypertensive medication regimens.

**Implications:** Kaiser Permanente Colorado conducted a study to compare the effects of a pharmacist-led HBPM system to that of usual care (UC) on BP control at six months, among 348 patients with uncontrolled hypertension. The results demonstrated the important impact of pharmacists’ involvement on BP control. There was significantly greater BP lowering.
BP control and increased patient satisfaction in the pharmacist-led HBPM group compared to UC. There was a −12.4 mm Hg (95% CI, −16.3 to −8.6) and −5.7 mm Hg (95% CI, −7.8 to −3.6) greater reduction in systolic BP and diastolic BP respectively for the HBPM group compared to UC. Blood pressure lowering and control was even greater among patients with diabetes mellitus and chronic kidney disease. Patient satisfaction with hypertension care was greater among the HBPM group (58%) than the UC group (42%; P<0.001). The HBPM group also proclaimed the BP cuff and Heart360 program to be very or extremely easy to use (68%), in addition to the pharmacy specialist being very or extremely helpful (52%). When pharmacists are able to assess report summaries and flag higher risk patients, monitor adherence to medications and make adjustments accordingly, they become the ideal first-line resource for hypertension management. Their high accessibility and medication knowledge grants them the ability to have a significant impact on current antihypertensive medication therapies.

**Background or research methods:** This pragmatic, randomized, controlled trial evaluated 348 hypertensive patients at 10 Kaiser Permanente Colorado clinics. Each clinic was equipped with a minimum of one clinical pharmacy specialist. Statistical analysis used intention-to-treat. Patients, in both HBPM and UC groups, returned after six months for an in-person clinic visit and BP check using a gold standard cuff. The primary outcome was the percentage of patients who achieved their BP goal. The change in both systolic BP and diastolic BP between baseline values, follow-up patient satisfaction, change in medication intensity and adherence to antihypertensive medication were secondary outcomes.

**Issue:** Uncontrolled, high blood pressure is the most frequent treatable risk factor for heart disease, stroke and death; 17.8% of deaths in the US are connected to hypertension.1 Hypertension remains uncontrolled despite adequate proof of the benefits of proper care. In the US, the National Health and Nutrition Examination Survey of 2005-2008 reported that a mere 43.6% of patients suffering with hypertension are controlled.2 Procedures to improve hypertension control are a focus for all areas of health care. One design proven to be effective incorporates interprofessional collaboration.3 It allows the physician and pharmacist to formulate a comprehensive care plan that optimizes drug therapy. Upon publication, team-based management was the best method of lowering blood pressure (BP) levels, seen more so with pharmacist involvement (−8.44 mm Hg systolic blood pressure [SBP]) than nurse involvement (−4.80 mm Hg SBP).4

**A solution:** Physician-pharmacist co-management has been proven to be advantageous in lowering BP levels; however, this study was conducted to analyze the pharmacists’ impact on antihypertensive medications and BP control within the ambulatory period. For a period of six months, two groups (one co-managed by a pharmacist and one control) were assessed based on their ambulatory BP levels. At the end of the trial, the co-managed group saw 467 drug therapy changes, with the most prominent occurring during the first month. The co-managed group also saw more drug changes than the control, 2.7 and 1.1 respectively (P<0.001). Upon the six-month visit, the co-managed groups’ mean ambulatory SBP was considerably lower than the control group at all three time intervals: daytime (122.8 mm Hg vs. 134.4 mm Hg; P<0.001), night time (114.8 mm Hg vs. 123.7 mm Hg; P<0.001) and the overall 24-hour period (120.4 mm Hg vs. 131.8 mm Hg; P<0.001). Such evidence promotes the physician-pharmacist collaboration to effectively decrease BP and improve management over 24 hours. Comparing SBP values over the 24-hour period, the co-managed group saw a 15.2 reduction whereas the control saw a mere 5.2. Despite the difference in BP control between both groups at the end of the study, the relative amount of antihypertensive medications between groups was quite similar. This suggests that pharmacists play an important role in proper antihypertensive medication selection and preparation of a drug therapy regimen. This is apparent considering the physician-pharmacist co-managed group received a much more intensified antihypertensive drug therapy.

**Implications:** Pharmacists are actively affecting antihypertensive therapy as demonstrated by 368 recommendations made by pharmacists to alter the drug therapy regimen, where 95% were accepted by physicians. Their extensive drug knowledge constitutes their ability to effectively lower BP levels and increase patients’ overall wellbeing. Pharmacists’ participation in the 24-hour ambulatory care period can significantly alter the antihypertensive medications, regimens and doses, ultimately leading to improved hypertension control in the foreseeable future. Co-management allows the pharmacist to recognize drug therapy problems and necessary lifestyle modifications, then develop appropriate care plans accordingly.

Intensive pharmacist management of veterans with hypertension improves adherence and significantly decreases blood pressure


**Issue:** As a modifiable risk factor, hypertension may lead to a wide range of cardiovascular events including stroke, peripheral vascular disease, heart disease and death. Every 3 mmHg drop in systolic blood pressure (SBP) may decrease cardiovascular and stroke mortality risk by 5% and 8%, respectively. A study has shown better optimal blood pressure (BP) control in veterans as compared to the public. This is attributed to the team-based approach that involves hypertension management by pharmacists. As per guidelines from the US Department of Defense, pharmacists can assist in medication adjustments to further improve and maintain BP control.

**A solution:** In community pharmacies, formalized guidelines have not been established for pharmacists in providing active intervention or referral back to primary care providers for hypertension. At the Iowa City Veteran Affairs Health Care System (VAHCS), primary care physicians authorized pharmacists to prescribe BP medication and order lab tests. For the first part of this study, three pharmacists provided intensive intervention for 127 subjects for six months. During the second part of this study after six months, subjects were randomized to continued intervention or back to usual care. However, data for this part is not yet available. Pharmacists educated patients on lifestyle modifications including smoking cessation, low sodium diet and regular exercise. Patient adherence was closely monitored. Solutions for unintentional poor adherence include regimen simplification, adherence aids and family assistance. For intentional poor adherence, pharmacists identified possible causes such as cost or side effects and reemphasized the importance of meeting BP goals. Upon suboptimal regimen identification, pharmacists had the prescriptive authority to increase the dose of existing medication, and/or add thiazide diuretics or other antihypertensive medications. Finally, an angiotensin-converting enzyme inhibitor was added for diabetic patients if not currently on one.

For the 54 diabetic patients, the mean decrease in SBP and diastolic blood pressure (DBP) was 8.0 mmHg (P < 0.001) and 4.0 mmHg (P = 0.001), respectively. A greater decrease in SBP and DBP was recorded in non-diabetic patients (14.0 and 5.0 mm Hg drop, P < 0.001). At six months, 69 subjects had controlled BP (< 140/90 mm Hg; < 140/80 mm Hg for diabetics) and 58 subjects had uncontrolled BP. The number of drugs increased significantly more frequently in subjects with controlled BP (P = 0.04). Furthermore, thiazide diuretics were used more often in the controlled BP subjects (P = 0.04): 64.9% and 46.7% in the controlled and uncontrolled group, respectively. Medication adherence also improved substantially between baseline and 6 months (P = 0.017).

In a qualitative evaluation conducted 24 months after patients were enrolled, five common themes were gathered and documented from 37 subjects: (1) subjects preferred physician-pharmacist co-management, (2) subjects experienced improved access to pharmacists, (3) subjects preferred the intensive intervention, (4) subjects claimed pharmacists helped decrease BP better than usual care and (5) subjects’ recall of lifestyle modifications offered by pharmacists was good. Furthermore, subjects are interested in physician-pharmacist co-management for other chronic conditions including diabetes.

**Implications:** Physician-pharmacist co-management of hypertension increases medication adherence, promotes recall of lifestyle change suggestions and significantly decreases SBP and DBP. Pharmacists with prescriptive authority can promptly adjust medication regimens to better minimize modifiable risk factors for cardiovascular conditions. Based on feedback from study subjects, there is a need and interest in utilizing this collaborative practice model for the long-term maintenance of hypertension and other chronic conditions.

**Background or research methods:** For this six-month prospective randomized control trial, 127 subjects from the Iowa City VAHCS and two community-based outreach clinics consented to participate. At baseline and six months, BP was measured three times by a trained study coordinator or research assistant. An average of the second and third reading was calculated. In between structured appointments at baseline, one, two, four and six months, pharmacists provided counseling over the phone. At 18 months after the six-month pharmacist intervention, the study coordinator conducted semi-structured interviews with 37 subjects. The randomization process occurred after the initial six-month pharmacist intervention period, but final results are not yet published.

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