Pay-for-performance remuneration for pharmacist prescribers' management of hypertension: A substudy of the RxACTION trial

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ABSTRACT

Background: To be sustainable, pharmacists providing direct patient care must receive appropriate payment for these services. This prespecified substudy of the RxACTION trial (a randomized trial of pharmacist prescribing vs usual care in patients with above-target blood pressure [BP]) aimed to determine if BP reduction achieved differed between patients whose pharmacist was paid by pay-for-performance (P4P) vs fee-for-service (FFS).

Methods: Within RxACTION, patients with elevated BP assigned to the pharmacist prescribing group were further randomized to P4P or FFS payment for the pharmacist. In FFS, pharmacists received $150 for the initial visit and $75 for follow-up visits. P4P included FFS payments plus incentives of $125 and $250 for each patient who reached 50% and 100% of the BP target, respectively. The primary outcome was difference in change in systolic BP between P4P and FFS groups.

Results: A total of 89 patients were randomized to P4P and 92 to the FFS group. Patients' average (SD) age was 63.0 (13.2) years, 49% were male and 76% were on antihypertensive drug therapy at baseline, taking a median of 2 (interquartile range = 1) medications. Mean systolic BP reductions in the P4P and FFS groups were 19.7 (SD = 18.4) vs 17.0 (SD = 16.4) mmHg, respectively ($p = 0.47$ for the comparison of deltas and $p = 0.29$ after multivariate adjustment).

Conclusions: This trial of pharmacist prescribing found substantial reductions in systolic BP among poorly controlled hypertensive individuals but with no appreciable difference when pharmacists were paid by P4P vs FFS. *Can Pharm J (Ott)* 2016;149:345-351.

Introduction

Pharmacy practice has shifted from a focus on drug distribution to incorporate direct patient care in an effort to better use pharmacists' drug therapy expertise and respond to a societal need. This shift is evident from a number of practice scope expansions worldwide, including policies allowing pharmacist adaptations of prescriptions, refill extensions, prescribing in an emergency or under collaborative practice agreements, the ordering and interpretation of lab tests, the administration of injections and, in some instances, initiating drug therapy.[1]

Alberta was the first Canadian province and the second jurisdiction worldwide to authorize pharmacists to independently prescribe drug therapy

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Recent changes to pharmacists' scope of practice and the pharmacy business model are leading to a reevaluation of how pharmacists are paid for patient care activities. Pay-for-performance models have been tried with mixed results among physicians, but have not previously been examined among pharmacists.

Les changements récemment apportés au champ d'exercice des pharmaciens et au modèle de gestion des pharmacies donnent lieu à une réévaluation de la manière dont les pharmaciens sont rémunérés pour leurs activités de soins des patients. Des modèles de rémunération en fonction du rendement ont été essayés chez les médecins, avec des résultats mitigés, mais n'ont jamais été examinés chez les pharmaciens.

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KNOWLEDGE INTO PRACTICE

- Pay-for-performance (P4P) has been largely unsuccessful in modifying physicians' practices or patient care outcomes achieved; however, this model has not previously been applied to pharmacy practice.
- This is the first study to compare patient outcomes achieved by pharmacists providing care for patients with uncontrolled hypertension under either a P4P or fee-for-service model.
- No appreciable effect of the payment model was noted on blood pressure outcomes achieved in the RxACTION trial, suggesting that outcomes-based remuneration may have little impact on pharmacists' patient care efforts.

for patients across a variety of disease states. This privilege, termed *additional prescribing authorization*, is granted to pharmacists following the successful completion of a comprehensive adjudication process.[2] Once granted, pharmacists can initiate or modify drug therapy across any disease state or drug class with the exception of narcotics and controlled drugs. However, pharmacists must prescribe in areas of their personal competence and take legal responsibility for the outcomes of their prescribing activities.

To ensure the provision of expanded scope activities, including prescribing, remuneration strategies have been developed to compensate pharmacists for providing care. Such payments are in addition to professional fees payable for dispensing prescription medications and are intended to offset the cost for the pharmacist to be away from the dispensary. A 2006 review was the first to systematically identify the remuneration programs in existence worldwide[3] and has since been recently updated.[4,5] Across all programs identified, pharmacists were paid on a fee-for-service (FFS) basis, whereby a flat rate is offered for each service offered regardless of the outcome.

Recently, there has been interest in linking health professionals' payment to outcomes achieved (pay-for-performance [P4P]). A systematic review published by our group found that, despite its increasing popularity among those advocating health care reforms, it is premature to conclude that P4P is associated with improved patient care outcomes, as current program evaluation studies reported highly variable results or were methodologically weak.[6] Thus, P4P should still be considered investigational until more high-quality studies have been conducted on its effectiveness.

The results of the Alberta Clinical Trial in Optimizing Hypertension (RxACTION) study demonstrated that enhanced pharmacist care, including prescribing, resulted in statistically significant reductions in systolic blood pressure (SBP) among patients with uncontrolled hypertension compared with usual care (18.3 vs 11.8 mmHg, $p = 0.0006$).[7] A prespecified substudy of the RxACTION trial further randomized those patients in the enhanced pharmacist care arm to either P4P or FFS remuneration for the pharmacist, allowing comparison of the 2 payment strategies.

This study's objective was to determine whether BP outcomes achieved in the RxACTION study differed between patients whose pharmacist was paid by P4P or FFS. This represents the first randomized evaluation of P4P among pharmacists.

Materials and methods

The methods of the RxACTION study (Clinicaltrials.gov NCT00878566) have been published in detail elsewhere.[8] Briefly, individuals were eligible for the study if they were identified as having uncontrolled BP following multiple screening visits in accordance with the Canadian Hypertension Education Program (CHEP) guidelines (Box 1), were older than 18 years and were not pregnant.[9-12] Ethics approval was obtained from the University of Alberta Health Research Ethics Board.

Upon enrollment, patients were randomized in a 2:1 ratio to enhanced pharmacist care or usual care for 6 months. Enhanced pharmacist care consisted of assessment of BP control, patient education and a review of antihypertensive medications and prescribing/titrating of drug therapy as needed according to the CHEP guidelines. Enhanced care patients were followed at 4-week intervals until BP was at target for 2 consecutive visits and at 3-month intervals thereafter until study completion. These patients could therefore receive a minimum of 4 to a maximum of 6 visits following the initial assessment, as the 6-month visit was required of all patients. Usual care consisted of a wallet card for recording BP, lifestyle advice, written information on cardiovascular disease and BP measurement by the pharmacist at 3 and 6 months following enrollment. Usual care patients were referred to their primary care physician for any further treatment.

Those patients randomized to enhanced care were further randomized in a 1:1 ratio to either P4P or FFS payment for the pharmacist. Under

BOX 1 Definitions of uncontrolled hypertension

Undiagnosed patients without macrovascular target organ damage, diabetes or chronic kidney disease:

- Average systolic blood pressure (BP) ≥180 OR diastolic BP ≥110 mmHg after 2 visits OR
- Average systolic BP 140-179 OR diastolic BP 90-109 after 2 visits and any 1 of:
  - Average systolic BP ≥140 OR diastolic BP ≥90 after 5 additional visits
  - Average systolic BP ≥135 OR diastolic BP ≥85 after 7 days of twice-daily home BP monitoring
  - Average systolic BP ≥130 OR diastolic BP ≥80 or average of awake hours ≥135 OR diastolic BP ≥85 after 24 hours of ambulatory BP monitoring

Undiagnosed patients with macrovascular target organ damage (coronary artery disease, cerebrovascular disease, diabetes): average systolic BP ≥140 OR diastolic BP ≥90 after 2 visits

Diagnosed patients without diabetes or chronic kidney disease: average systolic BP ≥140 OR diastolic BP ≥90 after 2 visits

Diagnosed patients with diabetes or chronic kidney disease: average systolic BP ≥130 OR diastolic BP ≥80 after 2 visits for those patients enrolled before June 2012. After June 2012, patients with nondiabetic chronic kidney disease were enrolled with average systolic BP ≥140 OR diastolic BP ≥90 after 2 visits*

*Target BP for patients with nondiabetic kidney disease was increased from <130/80 to <140/90 mmHg in the 2012 Canadian Hypertension Education Program guidelines.[12]

both models, pharmacists received CAD $150 for the initial visit (estimated to take 1 hour) and $75 per follow-up visit every 4 weeks (estimated to take 30 minutes). Under P4P, pharmacists were eligible for an additional $125 if the patient reached 50% of their target (i.e., a 50% reduction from baseline toward reaching their target BP) or $250 if target BP was achieved. Pharmacist participants in the study specified at the onset of the study whether payments should be provided in their name or to the employing business/organization.

The primary outcome of this substudy was the magnitude of reduction in SBP. Secondary outcomes were reduction in diastolic BP (DBP) between the P4P and FFS groups and the proportion of patients in each group who achieved target BP after 6 months.

The sample size of this substudy was designed to detect a 6 mmHg change in systolic BP between the P4P and FFS groups, with 80% power and a 2-sided α of 0.05 for a sample size of 224 for the primary outcome. The minimal clinically important difference of 6 mmHg was determined by consensus among a panel of pharmacists and physicians in internal and family medicine based on literature of antihypertensive drug effectiveness and clinical endpoint reductions associated with BP lowering. However, because of funding limitations, the main RxACTION trial stopped before we attained the target sample size for this substudy.

All analyses were conducted using IBM SPSS Statistics, version 21 (IBM Corp., Armonk, NY) and followed the intent-to-treat principle, with p set at 0.05. Multivariate linear regression with change in systolic BP as the dependent variable was performed to adjust for baseline imbalances between groups (defined as those characteristics with $p < 0.20$). Missing values were imputed using the last observation carried forward method.

Results

Between July 2009 and May 2013, 248 patients were enrolled into the RxACTION study. Of those, 181 were allocated to enhanced care, of which 89 were randomized to the P4P and 92 to the FFS arm. Both groups were similar at baseline, as described in Table 1. Patients' average (SD) age was 63 (13.2) years, 49% were male and 76% were on antihypertensive drug therapy, taking a median of 2 (interquartile range = 1) medications.

The SBP reduction in the P4P group was 19.7 (SD = 18.4) mmHg and in the FFS group was 17.0 (SD = 16.4) mmHg ($p = 0.47$ for crude comparison of deltas); after adjusting for age, sex, family

TABLE 1 Patient characteristics*

Variable	Fee-for-Service (*n* = 92)	Pay-for-Performance (*n* = 89)
Demographics		
Male sex	42 (45.7)	47 (52.8)
Age, mean (SD), years	62.8 (13.6)	63.1 (12.9)
Cardiovascular risk factors		
Systolic BP at baseline, mean (SD), mmHg	148.3 (13.7)	150.3 (15.0)
Diastolic BP at baseline, mean (SD), mmHg	83.3 (12.1)	84.4 (12.1)
First-degree relative history of MI	49 (53.3)†	38 (42.7)
First-degree relative history of angina	19 (20.7)	28 (31.5)
First-degree relative history of stroke	28 (30.4)	29 (32.6)
BMI, mean (SD)	31.9 (7.5)	31.7 (6.4)
Waist circumference, mean (SD), cm	106.4 (17.3)	106.4 (16.3)
Elevated waist circumference (>102 cm in men, >88 cm in women)	63 (68.5)	63 (70.8)
Smoking		
Current	15 (16.3)	17 (19.1)
Ex-smoker	37 (40.2)	41 (46.1)
Never	38 (41.3)	30 (33.7)
Alcohol consumption		
One or more servings per day	14 (15.2)	14 (15.7)
Occasional	49 (53.3)	41 (46.1)
Salt added to food		
Often/always	16 (17.4)	15 (16.9)
Sometimes	23 (25.0)	18 (20.2)
Self-reported cardiovascular comorbidities:		
Diabetes mellitus	37 (40.2)	34 (38.2)
Chronic kidney disease	15 (16.3)	16 (18.0)
History of MI	4 (4.3)	4 (4.5)
History of angina	11 (12.0)	12 (13.5)
History of heart failure	0	2 (2.2)
History of atrial fibrillation	12 (13.0)	10 (11.2)
History of stroke	4 (4.3)	6 (6.7)
Dyslipidemia	50 (54.3)	43 (48.3)
Peripheral artery disease	3 (3.3)†	8 (9.0)
Prior revascularization procedure	8 (8.7)	3 (3.4)
On antihypertensive drug therapy at baseline	68 (73.9)	69 (77.5)
Number (median, IQR) of drugs taken	2.0 (1.0)	2.0 (1.0)

SD, standard deviation; BP, blood pressure; MI, myocardial infarction; BMI, body mass index (calculated as weight in kilograms divided by height in meters squared); IQR, interquartile range.

*All data are given as numbers (percentages) unless otherwise indicated.

†Characteristics with baseline differences between groups at $p < 0.20$ and therefore included in multivariable models.

history of myocardial infarction (MI) and diagnosis of peripheral artery disease, there was no statistically significant difference between those patients randomized to P4P vs FFS remuneration (p = 0.29). DBP also decreased in both groups, by 7.6 (SD = 9.3) mmHg in the P4P group and 8.2 (SD = 8.3) mmHg in the FFS group—this difference was not statistically significant (p = 0.65) even after multivariate adjustment. The proportion of patients achieving CHEP-recommended target BP increased in both groups, with 63% of patients in the FFS group reaching target after 6 months vs 53% in the P4P group (by design, none were at target at enrolment). The absolute difference of 10% was not statistically significant (p = 0.16). This trial was large enough to exclude a 7.2 mmHg difference between FFS and P4P with 80% power and α of 0.05.

Recognizing that not all pharmacists may have seen direct personal benefit from incentive payments (for example, if payments went to the pharmacy and they were not an independent pharmacy owner or if they were salaried pharmacists not practising in community pharmacies) and therefore may not have been influenced by P4P to the same extent as those with direct benefit, a post hoc nonrandomized subgroup analysis was performed. Pharmacists were asked whether or not they received any direct financial benefit related to P4P payments. Of the 89 patients randomized to P4P, 43 (48%) received care from a pharmacist who personally benefitted from the performance payments, while the remaining 46 (52%) received care from a pharmacist without a personal financial interest in the BP outcome. BP reductions were similar in both subgroups (20.1/7.8 mmHg in those treated by no personal benefit P4P pharmacists vs 18.7/7.6 mmHg in those treated by pharmacists with personal benefit P4P, p = 0.71 for SBP and p = 0.91 for DBP).

Discussion

This randomized controlled trial of pharmacist prescribing for patients with uncontrolled hypertension found no appreciable difference in the magnitude of BP reduction seen among patients whose pharmacist was paid by P4P vs FFS, although both groups did exhibit substantial reductions in SBP (19.7 vs 17.0 mmHg, respectively). Even accounting for whether the pharmacist was an owner with potential for personal gain (vs a salaried employee without personal gain), P4P showed no greater reduction in systolic BP reduction. To our knowledge, this is the first study of performance-based incentives among pharmacists.

Despite being somewhat underpowered, the small magnitude of difference in systolic and diastolic BP observed is consistent with the results of our previous systematic review examining the impact of P4P on patient health outcomes.[6] Since the publication of that review, 2 additional randomized controlled trials were published, finding similar modest effects for cardiovascular risk factors[13] and hypertension specifically.[14] Previous work has also suggested the potential for P4P programs to incite gaming (i.e., exclusion of patients from denominators to improve percentage target achievement), falsifying of data or a fixation on measurable values rather than patient-centred goals.[15] While rates of such activities have been found to be generally low among physicians,[16] policy-makers should keep this in mind if P4P is pursued among pharmacists. Policy-makers should also consider that most pharmacists are paid by salary and may therefore be unaffected by performance-based payment offerings, which may benefit their employer rather than themselves. Our prior systematic review on this topic also concluded that the size of the incentive offered was not necessarily directly related to the magnitude of effect observed.[6] Future work should examine if a relationship exists among pharmacists between the size of incentives offered and any subsequent changes in behaviours or outcomes.

Given the cost of developing targets, measuring outcome attainment and processing P4P payments, one must also consider whether the clinical

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- En grande partie, la rémunération au rendement n'a pas réussi à modifier les pratiques des médecins ou les résultats des soins aux patients; toutefois, ce modèle n'a jamais été appliqué au secteur de la pharmacie.
- Cette étude est la première à comparer les résultats pour les patients obtenus par les pharmaciens offrant des soins aux patients présentant une hypertension non maîtrisée dans le cadre d'un modèle de rémunération au rendement ou de paiement à l'acte.
- Le modèle de rémunération n'a eu aucun effet appréciable sur les résultats de pression artérielle dans l'essai RxACTION, ce qui semble indiquer qu'une rémunération fondée sur les résultats aurait peu d'effet sur les activités de soins aux patients offertes par les pharmaciens.

benefits and/or cost savings realized as a result are sufficient to offset these operational expenses. Indeed, a US study conducted using administrative data from 86 primary care clinics found that P4P was not associated with any statistically significant change in patient care costs, after adjusting for patient age, gender and morbidity.[17] On the other hand, an economic model conducted by our group based on the SCRIP-*HTN* study found that pharmacist-provided care resulting in a systolic BP reduction of 5.6 mmHg over 6 months is likely cost neutral, if not cost saving, when considering reduced rates of MI, stroke and heart failure hospitalization secondary to improve BP control.[18]

This study was not without limitations. First, the study ended prior to enrollment of the full sample size of subjects, therefore resulting in the study being underpowered to detect a 6 mmHg difference in SBP reduction. However, our study was large enough to exclude a 7.2 mmHg difference between the P4P and FFS arms. Second, one must consider that pharmacist investigators for this study came from a variety of practice settings, ranging from independently owned pharmacies to chain pharmacies, hospital practice or family health team practice. Therefore, performance payments in the P4P arm may not have always been directed to the pharmacist providing the care. Indeed, more than half of the patients randomized to the P4P arm received care from a pharmacist who did not personally receive any financial benefit linked to performance outcomes. However, we did not find any difference in SBP reductions in those pharmacists who did vs did not receive direct financial benefit from the P4P incentive. Third, because of the nature of the study, pharmacists could not be blinded to their remuneration allocation for each patient. Fourth, although the size of SBP reduction was our primary outcome, as the incentive payments were triggered by achievement of target BP, some may argue that target attainment would have been a better outcome measurement. However, we chose absolute change in SBP, as this is more clearly translatable into long-term clinical benefit (we know what a 20 mmHg sustained reduction in SBP means, while the long-term implications of having an SBP of 139 [at target] vs one of 141 [above target] is less clear). Finally, with only a small proportion (approximately 10%) of practising pharmacists in Alberta having additional prescribing authorization at the time of the study, one cannot assume that those "early adopters" participating in our study are representative of the general population of pharmacists in terms of their motivation to provide patient-centred care. Future work will include conducting interviews with the RxACTION pharmacists to elucidate their perceptions of whether P4P payments influenced their clinical decision-making, professional satisfaction or workload.

The implications of our results are 2-fold: to inform future policy related to pharmacist remuneration strategies to ensure best use of limited health care funds and to start a discussion on the motivating factors that may influence the quality of care provided by pharmacists as their care practices expand in scope. Our results suggest that P4P may not significantly affect pharmacists' treatment approaches related to the management of patients with hypertension, but this needs to be studied across a larger sample and across a variety of disease states. Future remuneration programs including a P4P component for pharmacists are encouraged to consider the use of P4P to be experimental and thus include a robust evaluation strategy to assess the effectiveness of this approach. In addition, P4P is one of many approaches tried among physicians and other health professionals to improve care quality, including self-assessment, practice audits with feedback, public results reporting and peer rankings.[19] As pharmacists increasingly take on patient-centred roles, similar approaches should be considered and tested in this population.

Conclusions

The RxACTION study of pharmacist prescribing found substantial reductions in SBP among patients with poorly controlled hypertension. However, in the first study to compare 2 payment models for pharmacists' clinical care, a P4P model demonstrated no clinically or statistically significant impact on blood pressure reduction after 6 months when compared with an FFS model. ■

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