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# Benefits of pharmacist care in hypertension in Nova Scotia



The following report is based on peer-reviewed research published in the *Canadian Pharmacists Journal* titled Cost-effectiveness of pharmacist care for managing hypertension in Canada and authored by Carlo Marra, PharmD, PhD (lead author); Karissa Johnston, MSc, PhD; Valerie Santschi, PharmD, PhD; and Ross T. Tsuyuki, BSc(Pharm), PharmD, MSc, FCSHP, FACC.

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# Introduction

## Worldwide impact of hypertension

Worldwide, hypertension is the number one risk factor for disease and premature mortality.<sup>1</sup> With around a quarter of the planet's population estimated to have high blood pressure (about 1.13 billion people),<sup>2</sup> it is responsible for about 7.5 million deaths annually<sup>3</sup> and is associated with approximately 10% of direct medical costs globally.<sup>4</sup> Adding to the gravity of this situation is the fact that treatment and control of hypertension are poor, with over 40% of patients having uncontrolled blood pressure.<sup>5</sup> Taken together, these facts point to a considerable gap in hypertension care, a gap that requires new thinking to address this important and far-reaching public health problem.

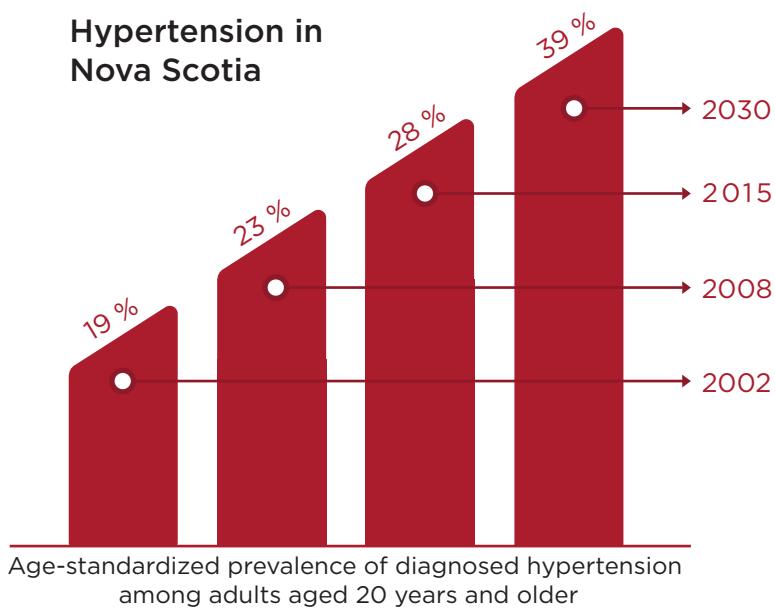
## Benefits of pharmacist intervention

The WHO's Global Action Plan for the prevention and control of non-communicable diseases 2013–2020 specifies, as one of its nine voluntary targets, a 25% reduction or containment of the prevalence of raised blood pressure. Intervention by pharmacists in hypertension care could make a significant contribution to that goal and can have meaningful results both in terms of benefits to health and cost effectiveness. Clinical trial evidence has clearly demonstrated the advantages of pharmacist intervention, including education, consultation, and/or prescribing, which can lead to a reduction in blood pressure. Beyond that, as hypertension is a major risk factor for cardiovascular disease, kidney failure and death, there is considerable opportunity to improve outcomes by preventing the onset and/or progression of these diseases by reducing the care gap in hypertension control.



## Hypertension in Nova Scotia

In Nova Scotia, around 166,000 people are living with hypertension.<sup>6</sup> Prevalence is currently 28% in adults and a third of those cases are not adequately controlled.<sup>7,8</sup> Prevalence is also expected to increase. Research from the US suggests that by 2030, hypertension prevalence will have increased by 7.2% from 2013 numbers.<sup>9,10</sup> In Canada, the situation is likely to be, at best, only slightly less severe.<sup>8</sup> While we are faring better than most countries with regards to both the prevalence and control of high blood pressure, improving on those numbers would have real benefits both in terms of lives saved and improved, as well as in reduced healthcare costs.



2002,<sup>11</sup> 2008,<sup>11</sup> 2015,<sup>7</sup> 2030 projection based on linear extrapolation of observed increases over time.

## Costs and burden of hypertension

The burden of hypertension on society is enormous both in health and economic terms. Evidence from the Institute for Health Metrics and Evaluation shows that, worldwide, high blood pressure was second only to dietary risks as cause of death in 2010.<sup>12</sup> It is responsible for 50% of the overall risk for heart disease and stroke,<sup>13</sup> as well as 28% of kidney failure.<sup>14</sup> It is also a contributing factor for dementia. Globally, it costs society more than \$370 billion (2001 US dollars) per year, with indirect costs relating to premature death and time missed from work estimated to be about 10% of the world's health expenditures.<sup>4</sup> Being able to improve these numbers even slightly would result in countless lives saved and improved and millions—perhaps even billions—of dollars saved.

# Opportunities for Pharmacist Intervention

## How pharmacists can help

For most people, it is far easier to see and speak to a pharmacist than a physician. In fact, on average, people see their pharmacist 5 to 7 times more often than they see their family doctor.<sup>15</sup> Pharmacists are highly accessible primary healthcare providers and ideally placed to address the care gap in hypertension management. A number of studies have already demonstrated how effective their intervention can be in this area. To date, pharmacist interventions in hypertension have largely been focused on patient education and counselling, recommendations to physicians about therapy management (including drug related problems, recommendations for changing pharmacotherapy and development of a care plan) and direct medication management with the patient (including monitoring with adjustment or change in medication).

We have studied a number of scenarios for what we term *partial scope* pharmacist intervention to *full scope* intervention. In the latter case, pharmacists make use of their full scope of skills for possible interventions, including prescribing. We found that all scenarios resulted in health improvements and cost savings when compared to current practice.

Full scope intervention includes the assessment of and counselling about cardiovascular risk and blood pressure control, reviewing antihypertensive medications, prescribing/titrating of drug therapy, laboratory testing, and follow up visits with the patient. This type of intervention has been shown to result in an average 18.3 mmHg reduction in systolic blood pressure.<sup>16</sup>

Partial scope intervention includes combinations of patient education, counselling, referrals, diagnostics, and interventions. Notably, in this case, the pharmacist may not be able to prescribe. These types of interventions have been shown to lead to a lowering of both systolic and diastolic blood pressure, with an average systolic blood pressure reduction of 7.6 mmHg.<sup>17</sup>

### Pharmacist Intervention



### Reduction in Systolic Blood Pressure

## Purpose of the analysis

While there is good evidence available for the health benefits of pharmacist intervention in hypertension management, including a recent clinical trial conducted in Canada,<sup>16</sup> as well as a combined analysis that looked at 39 trials internationally,<sup>17</sup> there has been, until now, a lack of research done on the economic value of this type of intervention, particularly in Canada. The analysis we have commissioned sought to extrapolate the observed benefits in trials of pharmacist intervention in blood pressure control in order to project the potential health impacts and cost effectiveness of pharmacist interventions over a longer time period.

We used a cost-effectiveness model to look at potential differences in long-term cardiovascular and kidney failure outcomes when different levels of blood pressure reduction were achieved through several potential levels of pharmacist intervention. The model takes into account various health outcomes, costs and quality of life. Costs considered include direct medical costs, as well as the costs associated with implementing the pharmacist intervention strategy. In general, we examined whether the intervention would decrease cardiovascular events and kidney failure; the magnitude of differences in survival and quality of life that could be achieved; the effects on direct medical costs and the cost-effectiveness of the intervention.

## About the model

The model, which has been peer-reviewed and published published in the *Canadian Pharmacists Journal* (C. Marra, K. Johnston, V. Santschi, R. Tsuyuki. [Cost-effectiveness of pharmacist care for managing hypertension in Canada](#)), was developed to compare two general scenarios for the relevant population.<sup>a</sup> For the first scenario, we consider the costs and health benefits of continuing with usual care, with limited opportunity for pharmacists to intervene in the care path. The second scenario analyzes the costs and health benefits of pharmacist intervention, with the magnitude of the impact dependent on the specific details of the type of intervention considered. The base case for the model examines the costs and health benefits of treating an eligible population over the course of 30 years,<sup>b</sup> but it is adjustable and allows other timeframes and health factors to be considered.

The model assumes that under usual care blood pressure stays consistent, as there is no increase in intervention. Without increased intervention, no decrease in blood pressure could be expected (in reality, this is a conservative assumption as blood pressure tends to get worse over time). The cost assumptions used for pharmacist intervention were based on six visits in the first year and quarterly thereafter.<sup>c</sup> In terms of costs of medicines, a

- a. The population used in the model was based on the population of the clinical trial conducted by Tsuyuki et al, to reflect the typical population accessing hypertension care in Canada. The average age was 63.5 years and the population was fairly evenly split between men and women. Average systolic blood pressure was 149.5, with 78% of the population already receiving treatment for high blood pressure.
- b. The assumed new incidence per year will be 2,338 cases ( $418,000 \times 35\% \text{ eligible} \times 50\% \text{ assumed to access intervention} \times 3.1\% \text{ of national hypertension in Nova Scotia, rounded slightly}$ ).<sup>9</sup>
- c. Costs were set at \$125 for the first visit and \$25 for subsequent visits, which reflects the current fee schedule in Alberta.

conservative assumption was made that costs would increase by \$30/month as a result of the intervention. This assumption is termed conservative because no difference in medication use was observed, on average, in clinical trials; pharmacists typically helped to optimize the medications that patients were already taking. In practice, the intervention group would likely have a reduction in physician visits for medication management, which would offset the additional pharmacist consultations, but this was not incorporated into the model—again, to be conservative.

Costs for cardiovascular disease and kidney failure were based on a review of published, peer-reviewed literature. ‘Background’ medical costs were set to the Canadian average.<sup>18</sup>

The trial testing the pharmacist intervention occurred over six months, and the model is based on the assumption that this intervention would continue to be effective in the longer term. The model allows for testing shorter and longer time horizons. It incorporates both conservative and optimistic estimates for a number of costs and benefits, including background medical costs, full and partial pharmacist intervention and a range of potential blood pressure outcomes.

For more detailed information on the different potential scenarios for and benefits from pharmacist intervention, we invite you to visit our [website](#). The model discussed here has been set up as an interactive tool that allows users to explore changes in economic and health impact under different timeframes and health scenarios.

## What the analysis demonstrates

The analysis shows a real and significant benefit from pharmacist intervention, both in terms of cost savings and health benefits when compared with usual care. In all analyses, the rates for cardiovascular disease and kidney failure are lowest with the full scope of pharmacist intervention and highest under the usual care regime. The results also highlight the relatively low costs of the program, particularly relative to the costs of treating cardiovascular disease or kidney failure.

### Health Benefits

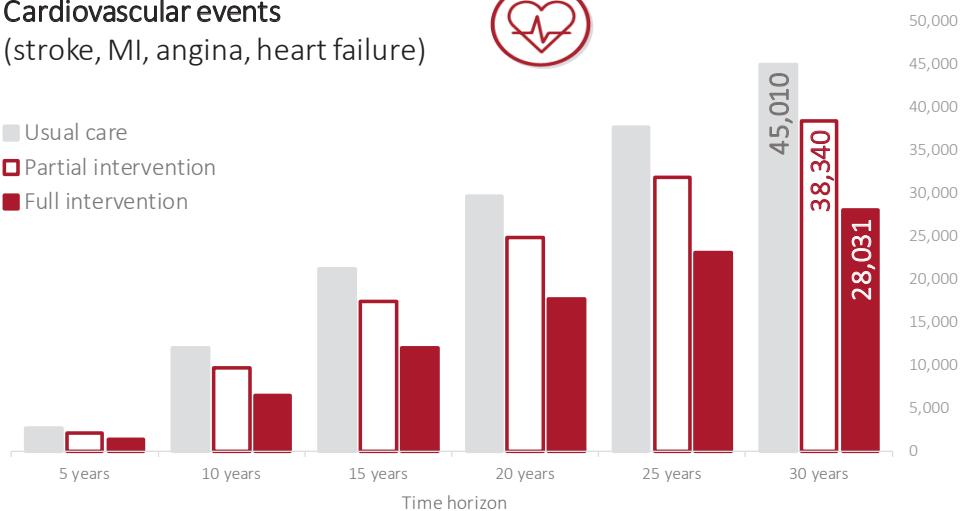
The analysis demonstrates a range of health benefits associated with pharmacist intervention in high blood pressure care. Previous research has shown that systolic blood pressure would be reduced by 18.3 mmHg with full scope pharmacist intervention.<sup>16</sup> When this is applied to our analysis, in the base case, over 30 years, it is estimated that for every five people receiving the intervention, one cardiovascular event (defined as stroke, myocardial infarction (MIs), angina and heart failure) would be avoided and four years of life would be saved. When the eligible population receiving the intervention<sup>d</sup> is considered as a whole over 30 years of full scope intervention, this would result in the following when compared to usual care: 4,166 fewer strokes; 8,248 fewer MIs; 2,382 fewer cases of angina; 2,183 fewer instances of heart failure; and 56 fewer instances of kidney failure. It would also result in an additional 29,719 years lived when the health impact is analyzed across the population.

d. 28,987 individuals initiating in year 1, plus 2,338 new individuals per year.

### Cardiovascular events (stroke, MI, angina, heart failure)



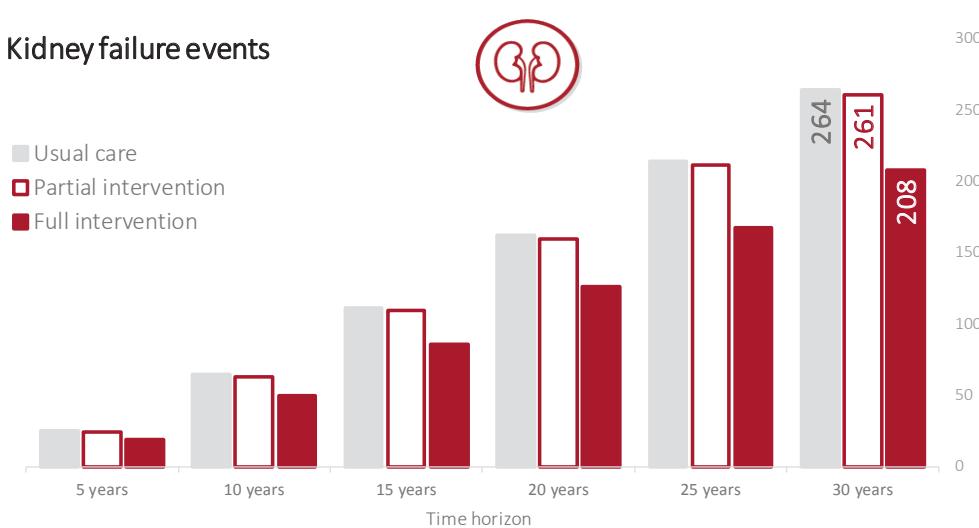
- Usual care
- Partial intervention
- Full intervention



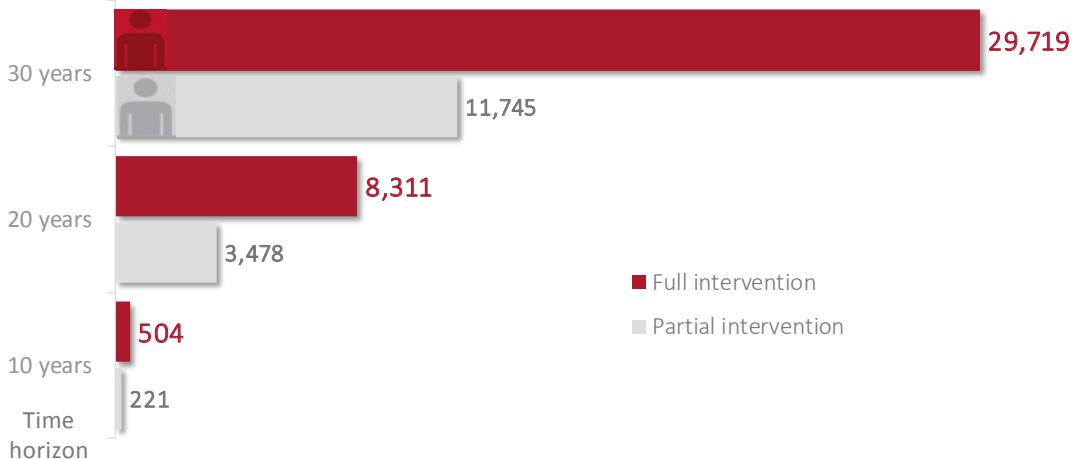
### Kidney failure events



- Usual care
- Partial intervention
- Full intervention



### Growth in saved life-years

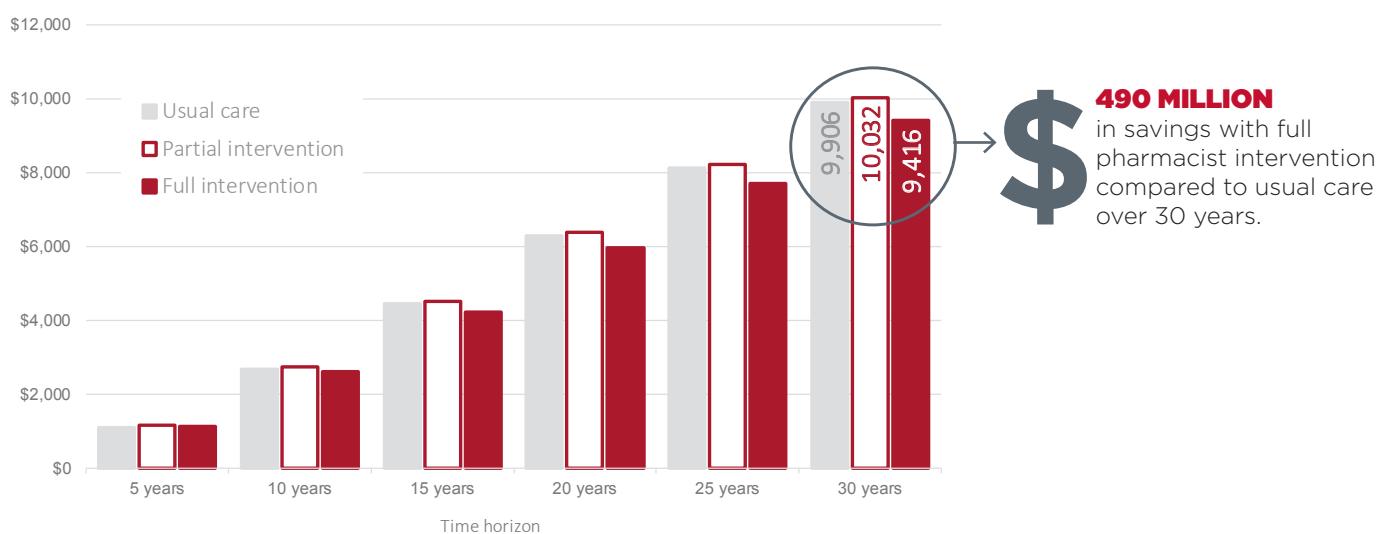


## Economic Impact

With healthcare dollars scarce and an aging population signaling increasing expenditures on cardiovascular disease and kidney failure, the economic benefits of pharmacist intervention in hypertension management also bear serious consideration. The analysis found that with full intervention for a patient with hypertension, there could be \$6,364 (today's dollars) in cost-savings over the lifetime of an individual accessing the intervention. The reduction in healthcare costs related to cardiovascular disease and kidney failure was found to more than offset the increased cost of pharmacist intervention (\$7,145 increase in costs for medication and the intervention vs. a \$15,093 reduction in costs related to cardiovascular disease and kidney failure treatment).

Thus, if the intervention were administered to eligible individuals<sup>e</sup> in Nova Scotia (this number is based on the conservative assumption that only half of those eligible would participate),<sup>f</sup> the projected cost savings over the lifetime of these individuals would be more than 490 million dollars. Further, given current trends in hypertension prevalence rates and healthcare costs, these cost savings are likely to increase. When the time horizon is reduced from 30 years to five years or less, the benefits are dramatically reduced—highlighting the need for patients to continue to access care over time and for pharmacists to continue to utilize their full scope of practice to provide care.

**Cumulative medical costs for individuals with hypertension (MILLIONS)**



e. 28,987 individuals initiating in year 1, plus 2,338 new individuals per year.

f. National or provincial population w/ hypertension x 35% eligible x 50% assumed to access intervention; rounded slightly.

# Conclusion

Comprehensive pharmacist care in hypertension, including patient education and prescribing, has the potential to offer both health benefits and cost savings to Canadians and, as such, has important public health implications. The findings show that pharmacist intervention in hypertension management could contribute to filling the hypertension care gap, not simply in a cost-effective manner, but indeed, in a *cost-saving* manner. It is rare to find a course of action that provides not just lower cost but better care as well. Given both these points, it would seem irresponsible not to give serious consideration to implementing a policy of pharmacist intervention in hypertension care. Indeed, the infrastructure for these services is already present. What needs to happen now is to expand pharmacists' scope of practice and incentivize pharmacists appropriately to provide this care. With a simple stroke of a pen, health policy could (and should) be changed to improve health outcomes for Canadians.



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