

## REDUCING COSTS AND IMPROVING HYPERTENSION MANAGEMENT

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### ABSTRACT

#### Objective

To quantify the cost-savings that could be realized by switching patients from two separate agents, ACE inhibitor/ARB and thiazide diuretic, to a fixed dose combination product.

#### Methods

CompuScript and Longitudinal Rx (LRx) Insights data from IMS Health Canada for Oct 2006-Sept 2007 was used. From the LRx data, the proportion of patients taking both ACE inhibitors/ARBs and thiazide diuretics as two separate products was calculated to determine how many would qualify for a combination product. From the CompuScript data, the total number of prescriptions for ACE inhibitors and ARBs and the actual average dollar value per prescription for thiazide diuretics, ACE inhibitors, ARBs, and ACE inhibitor/ARB with thiazide diuretic combination products was used to determine the potential cost savings of switching from two separate drugs to a combination product. As a sensitivity analysis, the proportion of patients receiving two separate products who could be switched to a combination product was varied from 60-100%. This analysis was done for Alberta and Canada.

#### Results

The conversion of ACE inhibitor/ARB and thiazide diuretic as two separate agents to a combination product could potentially result in a yearly cost-savings of \$27 to \$45 million for Canada (\$1.1 to \$1.9 million for Alberta), based on 60-100% conversion to a combination product.

#### Conclusions

The present analysis has shown that a simple intervention of converting patients receiving separate ACE inhibitor/ARB and thiazide diuretic prescriptions to a single combination product prescription will produce substantial cost-savings for the health care system and simplify the medication regimen for patients.

**Key Words:** *Hypertension; combination products; cost-savings; adherence*

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The 2008 Canadian Hypertension Education Program (CHEP) recommendations for the initial management of hypertension in adults without compelling indications for specific agents are monotherapy with a thiazide diuretic; a beta-blocker (in patients younger than 60 years); an angiotensin converting enzyme (ACE) inhibitor (in non-blacks); a long-acting calcium channel blocker (CCB); or an angiotensin receptor blocker

(ARB).<sup>1</sup> Angiotensin converting enzyme (ACE) inhibitors and angiotensin receptor blockers (ARBs) are indicated as first line antihypertensive therapy for patients with compelling indications arising from co-morbidities such as diabetes mellitus, chronic kidney disease or coronary heart disease.<sup>1</sup> Large clinical trials have shown that to achieve currently recommended blood pressure targets, two or more drugs will be required in

most patients.<sup>2,3</sup> The two drug regimen of an ACE inhibitor and thiazide diuretic has proven additive hypotensive effects and is the most common two drug antihypertensive regimen prescribed.<sup>4</sup> Most ACE inhibitor and ARB manufacturers market fixed dose combinations of these products, which may simplify the antihypertensive regimen and improve adherence.<sup>1,5</sup> In chronic asymptomatic diseases such as hypertension, adherence and continuation rates of medication therapy are low.<sup>5</sup> Simplifying drug regimens by reducing the number of dosing times and/or the number of pills has been shown to improve patient adherence.<sup>5,6</sup> Improved adherence can result in lower blood pressures and improved likelihood of achieving target blood pressures.<sup>5,7,8</sup>

The 2008 CHEP guidelines suggest one strategy to improve patient adherence is to replace two antihypertensive agents with a fixed dose combination (where available and appropriate), provided it is the same combination the patient is already taking.<sup>1</sup> Indeed, the 2008 CHEP guidelines now recommend combination therapy as a first line option in patients with initial blood pressure  $\geq 20/10$  mmHg above target.<sup>1</sup> In Canada, the pricing of combination products is similar to that of the single entity product, and as such, their use could even reduce costs by avoiding dispensing fees associated with the second prescription. The purpose of this study was to quantify the cost-savings that could be realized by switching patients from two separate agents, ACE inhibitor/ARB and thiazide diuretic, to a combination product.

## METHODS

Data obtained from IMS Health Canada was used for the time period of Oct 2006-Sept 2007. The CompuScript database compiles monthly dispensing records from a representative sample of two thirds of all Canadian retail pharmacies and projects this data to represent each province and the nation. This database tracks overall drug use, however, not at the level of individual patients; in this case, we needed to know the proportion of patients receiving both an ACE inhibitor/ARB and a thiazide diuretic concomitantly. The Longitudinal Rx (LRx) Insights database captures the prescription activity of anonymized patients over time from a sample of prescriptions – this

allowed us to calculate the proportion of patients currently taking both ACE inhibitors/ARBs and thiazide diuretics as two separate products to determine how many patients could potentially be switched to a combination product. This proportion was multiplied by the total number of prescriptions/year for ACE inhibitors to determine the number of prescriptions that could potentially be switched to a single combination product. From the CompuScript data, we utilized the actual average dollar value per prescription for ACE inhibitors, ARBs, diuretics and ACE inhibitor/ARB with diuretic combination products. The difference between the average dollar value of ACE inhibitor plus diuretic prescriptions (as separate prescriptions) and the average dollar value of the combination product prescription indicates the cost-savings per prescription that could be realized by switching to a combination product. Yearly cost-savings were calculated from the cost-savings per prescription multiplied by the number of prescriptions that could potentially be switched to a combination product.

As a sensitivity analysis, we varied the proportion of patients receiving the two separate products who could be switched to a combination product from 60-100%. The same calculations were done with the ARB data. We did this analysis for Alberta and Canada.

## RESULTS

In Alberta, 25% and in Canada, 27% of patients receiving an ACE inhibitor currently also receive a diuretic as a separate prescription, as estimated from the LRx database (Table 1). Similarly, in Alberta, 19% and in Canada, 21% of patients receiving an ARB currently also receive a diuretic. This means that 4.6 million prescriptions for ACE inhibitors per year in Canada could potentially be switched to a combination therapy (269,000 in Alberta), and 1.6 million prescriptions for ARBs could be switched to combination therapy (94,000 in Alberta). The average dollar value per prescription for ACE inhibitors, thiazide diuretics, ARBs and the fixed combination products were used to calculate the cost-savings per prescription and the overall cost-savings of switching to fixed combination products. Using rates of conversion of ACE inhibitors and ARBs

to combination therapy of 60-100%, the yearly cost savings would be \$27 million (i.e., \$15,021,133 + \$11,838,038) to \$45 million (\$25,035,221 + \$19,730,064) for Canada and \$1.1 to \$1.9 million in Alberta alone.

## DISCUSSION

The present analysis has shown that a simple intervention of converting patients receiving separate ACE inhibitor/ARB and thiazide diuretic prescriptions to a single combination product prescription will produce substantial cost-savings for the Canadian health care system: \$27 to 45 million per year. This is likely one of the few simple interventions that could both reduce costs and improve hypertension management.

Recognizing that, for a number of reasons, not all patients on an ACE inhibitor/ARB and diuretic could be switched to a fixed dose combination product, we varied the proportion that could potentially be switched from 60-100%. Non-adherence to antihypertensive regimens contributes to the disparity between anticipated BP outcomes with therapy and actual BP achievement.<sup>5</sup> Use of combination antihypertensive therapy improves patient adherence, compared with the prescribing of two agents as separate drugs.<sup>5,6</sup> The risk of non-adherence is reduced by 24% with the use of fixed dose antihypertensive combination products as compared to the use of two separate drugs.<sup>5</sup> Also, additive blood pressure reductions can be achieved with the use of combination antihypertensive therapy.<sup>9,10</sup> Recently, the ADVANCE trial showed the benefits of initiating a fixed dose combination of an ACE inhibitor and diuretic in type 2 diabetics, irrespective of initial blood pressure levels.<sup>11</sup> In this study, routine administration of perindopril and indapamide in a fixed dose combination product to patients with type 2 diabetes significantly reduced the risk of cardiovascular death and all-cause mortality and was well tolerated.<sup>11</sup>

Our study has some limitations. First, CompuScript collects data from two-thirds of pharmacies and extrapolates that to all of Canada. It also provides an average dollar value for prescriptions (based upon different durations of prescriptions), although these are “real” costs charged by the pharmacies. From the

CompuScript data, we elected to use the average dollar value per prescription (which includes mark-ups and professional fees) recognizing that acquisition costs will differ slightly from pharmacy to pharmacy. Secondly, the proportion which could be switched to a combination product is unknown; therefore, we used a sensitivity analysis to provide a range of potential cost savings. Additional cost-savings could also be obtained by switching the 25% of inappropriate combinations of antihypertensive medications in Canada to an ACE inhibitor/ARB and diuretic combination.<sup>4</sup> Finally, many patients prescribed monotherapy with an ACE inhibitor, ARB or thiazide are not treated to the recommended BP target; switching these patients to combination products may help to improve BP control.

Cost savings from this intervention could be put back into the health care system to fund programs aimed at improving detection and management of hypertension. For example, this intervention could be implemented by pharmacists identifying patients who could be switched to a fixed dose antihypertensive combination product from a review of their prescription records. In turn, the cost-savings generated from this simple intervention could be used to fund hypertension disease management programs by health care professionals such as pharmacists and nurses<sup>12</sup> to further improve the management of this condition.

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**TABLE 1** Potential cost savings in patients receiving ACE inhibitors or ARBs with diuretics that could be switched to a combination product

		Total number of ACE inhibitor or ARB prescriptions dispensed/y	Proportion of patients on ACE inhibitor or ARB and a thiazide <sup>a</sup> (%)	Total prescriptions/y of ACE inhibitor or ARB and a diuretic that could potentially be switched to a combination product <sup>b</sup>	Prescription cost difference between ACE inhibitor or ARB and diuretic as 2 separate drugs vs. combination product <sup>c</sup> (\$)	Yearly cost savings 60% conversion (\$) <sup>d</sup>	Yearly cost savings 75% conversion (\$) <sup>d</sup>	Yearly cost savings 100% conversion (\$) <sup>d</sup>
<b>ACE inhibitors</b>	Alberta	1,074,292	25	268,573	3.10	499,546	624,432	832,576
	Canada	17,076,068	27	4,610,538	5.43	15,021,133	18,776,416	25,035,221
<b>ARBs</b>	Alberta	493,135	19	93,696	11.21	630,199	787,749	1,050,332
	Canada	7,480,312	21	1,570,865	12.56	11,838,038	14,797,548	19,730,064

<sup>a</sup> Proportion of patients currently on ACE inhibitor (or ARB) and diuretic as two separate products = total number of patients on ACE inhibitors (or ARBs) and thiazide diuretics (as 2 products)/Total number of patients on ACE inhibitors (or ARBs) x 100%

<sup>b</sup> Number of prescriptions that could be switched to a combination product = Total ACE inhibitor prescriptions (or ARB) x proportion of patients currently on ACE inhibitor (or ARB) and diuretic

<sup>c</sup> Cost differential per prescription = Average prescription cost of ACE inhibitor (or ARB) and diuretic as two separate drugs (including markups and professional fees) – average prescription cost of combination product (including markups and professional fees) from IMS CompuScript data

<sup>d</sup> Yearly cost savings = Cost savings per prescription x number of prescriptions that could potentially be switched to a combination product x proportion conversion

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