

# 2009 Canadian Hypertension Education Program recommendations

*An annual update*

On behalf of the Canadian Hypertension Education Program

Hypertension is one of the main health issues facing our country. In 2005, 5.7 million Canadians were diagnosed with hypertension and more than 5 million of them were using pharmacotherapy. For the past decade, hypertension has been the leading diagnosis for adult visits to physicians, and the proportion of total visits to physicians for hypertension is increasing.<sup>1</sup> The World Health Organization has indicated that increased blood pressure is the leading risk factor for death, predicting an epidemic of hypertension, and is advocating prevention and treatment programs as a priority.<sup>2</sup> In 2000, there were more than 7 million deaths attributed to suboptimal blood pressure.<sup>3</sup>

For the Canadian Hypertension Education Program (CHEP), 2009 marks the tenth consecutive year that the recommendations for the management of hypertension have been updated. The program was developed to enhance clinical management of hypertension and hence reduce the burden of cardiovascular disease in Canada.<sup>4</sup> Recent data have suggested Canada is likely the world's leading country in the prevention and control of hypertension, with a 5-fold increase in treatment and control of hypertension in Ontario between 1992 and 2006<sup>5</sup> and a large increase in treatment of hypertension and reduction in cardiovascular disease rates that occurred at the time CHEP was initiated.<sup>6</sup>

The program has continued to evolve over the past decade and in many cases can now identify specific clinical scenarios that require improvement in clinical care.<sup>7-9</sup> This year CHEP is focusing on reducing death and cardiovascular disease in people with diabetes by encouraging health care professionals to ensure their patients' blood pressures are maintained at less than 130/80 mm Hg. New Canadian data indicate that only a minority of people with diabetes and hypertension are achieving adequate control of their blood pressure; therefore, avoidable deaths and disability continue to occur.<sup>10</sup>

## Hypertension in patients with diabetes

Up to 80% of people with diabetes die of cardiovascular disease, and many diabetic complications are attributable to elevated blood pressure.<sup>11</sup> Although elevated blood glucose levels are a cause of kidney and eye disease, elevated blood pressure in people with diabetes is also a main cause of kidney failure and eye disease.<sup>12,13</sup> Most people with diabetes have hypertension and almost 1 in 5 people with hypertension have diabetes.<sup>10</sup>

Treating hypertension in people with diabetes is one of the most cost-effective medical interventions available to reduce death and disability.<sup>14</sup> Reduction in death and major cardiovascular event rates of more than 50% can occur in people with diabetes and hypertension whose blood pressure is treated.<sup>15,16</sup> Even more intensive hypertension treatment reduces death and cardiovascular events by 25%, compared with conventional treatment levels.<sup>17</sup> Hypertension treatment also reduces the progression of diabetic retinopathy and kidney disease.<sup>12,13,18-21</sup>

The recently completed Heart and Stroke Foundation survey of blood pressure awareness, treatment, and control from the province of Ontario found unprecedented levels of blood pressure control, with 2 out of 3 people with hypertension under control; however, the rate of hypertension control for people with diabetes was only 1 in 3, with two-thirds above the target of less than 130/80 mm Hg.<sup>10</sup> This lack of blood pressure control in people with diabetes might be in large part due to the relatively low use of diuretic therapy—the cornerstone of treatment of resistant hypertension in this population.<sup>22-24</sup>

Combinations of lifestyle modification and 3 to 4 or more drugs might be required for blood pressure control in people with diabetes.<sup>25</sup> The prescription of an angiotensin-converting enzyme (ACE) inhibitor or angiotensin receptor blocker (ARB) is recommended in all people with diabetes who have hypertension<sup>26</sup> (Table 1).<sup>\*</sup> Alternative first-line treatments include long-acting calcium channel blockers and low-dose diuretics in people without proteinuria. If the blood pressure is 150/90 mm Hg or more, consideration should be given to initiating therapy with a combination of 2 drugs. Diuretic therapy is generally necessary for blood pressure control when 3 or more drugs are used, and reduces major cardiovascular events in people with diabetes to the same extent as other drug classes.<sup>27</sup> Maintaining normal serum potassium levels is important to lessen the affect of diuretics on blood glucose and maximize cardiovascular event reductions.<sup>28,29</sup> If blood pressure control is not achieved with sequential addition of antihypertensive drugs, consider referral to an



\*Tables 1 to 8 are available at [www.cfp.ca](http://www.cfp.ca). Go to the full text of this article on-line, then click on CFPlus in the menu at the top right-hand side of the page.

expert in hypertension. Take note that in the largest trial examining intensive versus less intensive blood pressure lowering, quality of life improved in the people treated to lower blood pressure levels.<sup>30</sup>

### What's new

In 2008 there were several new clinical trials of interest to clinicians. The ONTARGET (Ongoing Telmisartan Alone and in Combination with Ramipril Global Endpoint Trial) results showed that an ACE inhibitor or an ARB had similar cardiovascular outcomes when prescribed to people with cardiovascular disease or type II diabetes.<sup>31,32</sup> The ONTARGET results also showed that while the combination of an ACE inhibitor with an ARB had some extra blood pressure lowering, it had more side effects, such as hyperkalemia, hypotension, and renal impairment, and did not improve patient outcomes compared with the ACE inhibitor alone. In people with stage 3 chronic kidney disease (glomerular filtration rate >30 mL/min), the combination of an ACE inhibitor with an ARB reduced urine protein levels, but did not reduce cardiovascular outcomes and did increase adverse renal outcomes, including the need for acute dialysis, compared with the ACE inhibitor alone.<sup>32</sup>

The only data to support improved patient outcomes from the combination of an ACE inhibitor with an ARB are in people with heart failure, as the combination reduces recurrent hospitalization. There are ongoing trials studying the combination of ACE inhibitors with ARBs in people with chronic kidney disease and diabetes. Hence, therapy using the combination of an ACE inhibitor and an ARB should only be considered in selected and closely monitored people with advanced heart failure or proteinuric nephropathy<sup>26</sup> (Table 1).<sup>\*</sup> For people already using the combination who have stable BP conditions, clinicians need to consider that prescribing just 1 of the 2 classes reduces cardiovascular events to the same extent and that other therapeutic regimes have the potential to reduce cardiovascular events and blood pressure to a greater degree.

In 2008, the HYVET (Hypertension in the Very Elderly Trial) results showed large reductions in cardiovascular events and mortality in quite healthy but very elderly people (older than age 80) treated for hypertension.<sup>33</sup> Hence CHEP now specifically recommends that age not be used as a factor in prescribing pharmacotherapy for hypertension.<sup>26</sup> Nevertheless, CHEP continues to recommend caution in treating hypertension in frail elderly people where the risks of therapy and hypotension are likely to be higher. Cases in which the risks might outweigh the benefits include patients with postural hypotension or postprandial hypotension and people who have poor short-term prognoses owing to competing comorbidity.

Other important clinical trials with ARB-based therapy to lower blood pressure were considered (PROFESS<sup>34</sup> [Prevention Regimen for Effectively Avoiding Second

Strokes] and TRANSCEND<sup>35</sup> [Telmisartan Randomized Assessment Study in ACE Intolerant Subjects with Cardiovascular Disease]), but did not result in changes to the CHEP recommendations.

### Home blood pressure measurement

The CHEP recommendations continue to encourage home measurement of blood pressure as a step toward greater patient self-efficacy. Home blood pressure readings have a stronger association with cardiovascular outcomes than readings taken in a health care professional's office. Home readings can be used to confirm the diagnosis of hypertension, improve blood pressure control, reduce the need for medications in those with white-coat effect, identify those with white-coat and masked hypertension, and improve medication adherence.<sup>36</sup> Patient instructions for purchasing and using home blood pressure measurement devices can be found at [www.hypertension.ca](http://www.hypertension.ca) and [www.heartandstroke.ca/BP](http://www.heartandstroke.ca/BP). A home measurement instructional DVD is available for download from the [hypertension.ca](http://www.hypertension.ca) site. Table 2\* provides patients with general instructions for home measurement of blood pressure.

### Other key recommendations

**Assess blood pressure at all appropriate visits.** Blood pressure increases with age, such that 50% of Canadians older than age 65 have hypertension. For those with normal blood pressure between the ages of 55 and 65 years, more than 90% will develop hypertension within an average lifespan. To identify those with hypertension, all adults require ongoing assessment of blood pressure throughout their lives and those with high-normal blood pressure require annual assessment.

**Assess and manage overall cardiovascular risk factors (eg, smoking, dyslipidemia and dysglycemia [eg, glucose intolerance, diabetes], abdominal obesity, unhealthy eating, and physical inactivity) in all people with hypertension.** Most Canadians with hypertension have other cardiovascular risks. Identifying and managing risk factors in addition to hypertension can double the risk reduction in cardiovascular disease as well as alter both the blood pressure target values (Table 3)\* and specific classes of medications recommended (Table 1).<sup>\*</sup> At present only half of younger people diagnosed with hypertension are treated even if they have multiple cardiovascular risks, and those who smoke are less, rather than more, likely to be treated.<sup>9</sup> Younger people with hypertension and multiple cardiovascular risk factors (male sex, sedentary behaviour, poor dietary habits, obesity, smoking, etc) are recommended to be considered for pharmacotherapy.<sup>26</sup> In general, people with hypertension who smoke and cannot quit are recommended to be prescribed anti-hypertensive therapy, but  $\beta$ -blockers should be avoided as first-line therapy in these people.

***Sustained lifestyle modification is the cornerstone for the prevention and management of hypertension and cardiovascular disease.*** Hypertension can be prevented and treated and other cardiovascular risks can be improved through healthy eating, regular physical activity, low-risk alcohol consumption, reductions in dietary sodium, and, in some cases, stress reduction (Table 4).<sup>\*</sup> Unfortunately, after a diagnosis of hypertension few Canadians improve their lifestyles<sup>8</sup>; however, simple and brief interventions by health care professionals increase the probability of patients making lifestyle changes.<sup>37</sup> Table 5<sup>\*</sup> provides advice for patients on how to reduce dietary sodium. Table 6<sup>\*</sup> outlines Internet resources to assist patients in the self-management of their care. A new section of the Heart and Stroke Foundation website ([www.heartandstroke.ca/BP](http://www.heartandstroke.ca/BP)) has recently been designed to assess the lifestyles of hypertensive patients and to provide individualized approaches to and monitoring of lifestyle changes. Several patient handouts on hypertension can also be ordered from [www.hypertension.ca/bpc](http://www.hypertension.ca/bpc).

***Treat patients to the recommended blood pressure targets to achieve optimum cardiovascular risk reduction (<140/90 mm Hg; <130/80 mm Hg in people with diabetes or chronic kidney disease).*** Greater reduction in cardiovascular disease is achieved by lowering blood pressure to the stated targets (Table 3).<sup>\*</sup> In people with diabetes and hypertension, lowering blood pressure to less than 130/80 mm Hg markedly decreases cardiovascular death and hospitalization.

***Combination therapy (both drugs and lifestyle changes) is generally necessary to achieve target blood pressures.*** Most people require multiple antihypertensive drugs as well as lifestyle changes. When using 2 drugs to lower blood pressure, combinations of a  $\beta$ -blocker, ACE inhibitor, or ARB produce a less-than-additive hypotensive effect and should be avoided unless there is a specific indication. If blood pressure is >20/10 mm Hg above target, initiating therapy with a combination of 2 first-line antihypertensive drugs is a first-line option.

***Monitor people whose blood pressure is above target at least every 2 months.*** To achieve blood pressure control, follow-up at short intervals is required to improve patient adherence to therapy and to increase the intensity of treatment.

***Focus on adherence.*** Adherence to pharmacotherapy and lifestyle change should be routinely assessed at each visit. Health care professional interventions can both prevent nonadherence and improve adherence in those who are having problems (Table 7).<sup>\*</sup>

### Comments from the CHEP Executive

The CHEP team works closely with the College of

Family Physicians of Canada, Canadian Council of Cardiovascular Nurses, Canadian Pharmacists Association, Heart and Stroke Foundation, Public Health Agency of Canada, Statistics Canada, and other organizations to improve hypertension prevention and control. In particular, the CHEP team is working closely with Blood Pressure Canada to develop and disseminate patient information on hypertension to improve patient self-efficacy in managing hypertension. An important recent activity has been the development of a joint committee with Blood Pressure Canada to produce patient and health care professional aids for reducing dietary sodium. The effort to prevent hypertension by a reduction in dietary sodium could reduce cardiovascular events by 13%<sup>38</sup> and could save more than a billion dollars in health spending a year.

Although the effort to improve hypertension management has been associated with large reductions in cardiovascular disease, hypertension remains a serious health risk to Canadians.<sup>6</sup> Two-thirds of people with diabetes in Ontario (and likely in other Canadian provinces) who are hypertensive have uncontrolled blood pressure. People with diabetes and hypertension represent one of the highest cardiovascular risk groups for primary prevention and also have the greatest potential benefit from lowering blood pressure. It is also concerning that the number of cardiovascular risk factors among younger hypertensive Canadians does not affect whether they receive drug treatment for hypertension. Further, hypertensive Canadians who smoke are even less, rather than more, likely to be treated for hypertension.<sup>9</sup> While lifestyle therapy alone is appropriate for young people with hypertension who are at low cardiovascular risk, most of them have multiple cardiovascular risk factors and are strong candidates for pharmacotherapy. Perhaps even more concerning is that after being diagnosed with hypertension, Canadians make only very minor improvements in lifestyles and on average even gain weight.<sup>8</sup> More emphasis on lifestyle change is required. We hope that the health care reform of increased primary health care

### Resources

A version of the hypertension recommendations designed for patient and public education was developed in 2008. Bulk orders of 25 or more copies can be obtained by contacting [hyperten@ucalgary.ca](mailto:hyperten@ucalgary.ca). Hypertension recommendations for patients with diabetes, developed in 2009, are also available. These summaries are available electronically at [www.hypertension.ca/bpc](http://www.hypertension.ca/bpc). A free, confidential, Web-based tool for patients is available at [www.heartandstroke.ca/BP](http://www.heartandstroke.ca/BP). Developed by the Heart and Stroke Foundation, the Blood Pressure Action Plan enables patients to build personalized action plans tailored to their risk profiles, promotes self-management, and helps patients make lifestyle changes, monitor their blood pressure, and print reports for their health care providers.

teams will have a substantial effect on lifestyle improvement among Canadians with hypertension.

A detailed survey of Canadians with hypertension is being conducted in 2009 to determine their knowledge of, attitudes toward, beliefs about, and behaviour with hypertension. In 2010 the results of a national blood pressure survey will indicate the Canadian rates of treatment and control. The surveys will indicate and document the areas of hypertension management that require improvement and will be used to develop more effective educational interventions for health care professionals and their patients. In the meantime, Blood Pressure Canada has developed a new resource to assist teams of interdisciplinary health care professionals to educate people about hypertension, lifestyle changes, and home measurement of blood pressure (Brief Action Tool at [www.hypertension.ca/bpc](http://www.hypertension.ca/bpc)).

Later this year, a national strategy for prevention and control of cardiovascular disease in Canada will be released. The strategy will provide guidance for prevention and control of hypertension in the context of reducing cardiovascular disease. The CHEP team anticipates that the strategy, if implemented, will lead to greater government involvement and a much greater reduction in cardiovascular disease in Canada.

The CHEP executive would like to thank the more than 100 health care professional volunteers, many of whom give hundreds of hours of their time each year, who have been involved for a decade now in developing, disseminating, and evaluating the annual Canadian recommendations for the management of hypertension (Table 8).<sup>\*</sup> The collaborative approach of the volunteers from clinic practices, academia, and governments, with the support of the primary care professional associations, the pharmaceutical health care industry, governments, charities, and scientific organizations, has been associated with marked improvements in the management and outcomes of Canadians with hypertension.<sup>6</sup>

The Canadian Hypertension Education Program is overseen by a steering committee that includes the Canadian Council of Cardiovascular Nurses, the Canadian Pharmacy Association, the College of Family Physicians of Canada, the Public Health Agency of Canada, the Canadian Hypertension Society, Blood Pressure Canada, and the Heart and Stroke Foundation of Canada. The program is unique in having a specific implementation task force with subgroups of family physicians, nurses, pharmacists, and medical specialists to oversee translation of the recommendations into education material suited to their disciplines; the program also has a task force to evaluate whether the process is improving hypertension management in Canada.

#### Acknowledgment

This manuscript was written by Dr N. Campbell, with the assistance of the Canadian Hypertension Education Program Executive, Dr D.W. McKay and Dr G. Tremblay.

#### Competing interests

None declared

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