

## 2009 Canadian Hypertension Education Program Recommendations: The Short Clinical Summary - An Annual Update

Programme  
Éducatif  
Canadien sur  
l'Hypertension



Canadian  
Hypertension  
Education  
Program

On behalf of the Canadian Hypertension Education Program

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Hypertension recommendations designed for patient and public education have been 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 people 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 people to get a personalized action plan tailored to their risk profile, promote self-management and help people to make lifestyle changes, monitor their blood pressure and print reports to take to their healthcare provider.

Hypertension is one of the major health issues facing our country. In 2005, 5.7 million Canadians had been diagnosed with hypertension and just over 5 million were on pharmacotherapy. For the last decade, hypertension has been the leading diagnosis for adult visits to physicians and the proportion of total visits to a physician for hypertension are increasing<sup>1</sup>. The World Health Organization has indicated that increased blood pressure is the leading risk for death, predicting an epidemic of hypertension and is advocating for prevention and treatment programs as a priority<sup>2</sup>. Worldwide over 7 million deaths in the year 2000 were attributed to sub optimum blood pressure<sup>3</sup>.

**2009** marks the 10th consecutive year that the Canadian Hypertension Education Program (CHEP) has updated recommendations for the management of hypertension. CHEP 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 five 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 CHEP program has continued to evolve over the last decade and in many cases can now identify specific clinical scenarios that require improvement in clinical care<sup>7-9</sup>. This year CHEP focuses on reducing death and cardiovascular disease in people with diabetes by encouraging health care professionals to ensure their patients' blood pressure is maintained less than 130/80 mmHg. New Canadian data indicate a minority of people with diabetes and hypertension are achieving adequate control of their blood pressure and thus continue to incur avoidable deaths and disability<sup>10</sup>.

### **The 2009 CHEP theme is: Hypertension in the patient 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 is a cause of kidney and eye disease, elevated blood pressure in people with diabetes is also a major 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 to conventional treatment levels<sup>17</sup>. Hypertension treatment also reduces the progression of diabetic retinopathy and kidney disease<sup>18 19 20 12, 13, 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, for people with diabetes rates of control were only 1 in 3, with 2/3rds above the target of less than 130/80 mmHg<sup>10</sup>. This lack of blood pressure control in people with diabetes may be in large part due to the relatively low use of diuretic therapy – the cornerstone of treatment for resistant hypertension in this population<sup>22-24</sup>.

Combinations of lifestyle modification and 3 to 4 or more drugs may be required for blood pressure control in persons with diabetes<sup>25</sup>. The prescription of an angiotensin converting enzyme inhibitor (ACE inhibitor) or angiotensin receptor blocker is recommended in all people with diabetes who are hypertensive (table 1) [CHEP 2009 Recommendations submitted to CJC for publication]. Alternative first line treatments include long acting calcium channel blockers and low dose diuretics in people without proteinuria [CHEP 2009 Recommendations submitted to CJC for publication]. If the blood pressure is 150/90 mmHg or more consideration should be given to initiating therapy with a combination of two drugs. Diuretic therapy is generally necessary for blood pressure control when three or more drugs are used and reduces major cardiovascular events in people with diabetes to the same extent as other drug classes<sup>26</sup>. Maintaining normal serum potassium levels is important to lessen the impact of diuretics on blood glucose and maximize cardiovascular event reductions<sup>27,28</sup>. If blood pressure control is not achieved with sequential addition of antihypertensive drugs consider referral to a expert in hypertension. Of note quality of life improved in the people treated to lower blood pressure levels in the largest trial examining intensive vs. less intensive blood pressure lowering<sup>29</sup>.

### **What's new**

In 2008 there were several new clinical trials of interest to clinicians. The ONTARGET trial found that an ACE inhibitor or an angiotensin receptor blocker had similar cardiovascular outcomes when prescribed to people with cardiovascular disease or type II diabetes<sup>30,31</sup>. The ONTARGET trial also found that while the combination of an ACE inhibitor with an angiotensin receptor blocker 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 to the ACE inhibitor alone. In people with stage 3 chronic kidney disease (GFR > 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 to the ACE inhibitor alone<sup>31</sup>.

The only data to support improved patient outcomes from the combination of an ACE inhibitor with an angiotensin receptor blocker is in people with heart failure where the combination reduces recurrent hospitalization. There are ongoing trials of combination of an ACE inhibitor with an angiotensin receptor blocker in people with chronic kidney disease and diabetes. Hence the use of combination of ACE inhibitor and ARB therapy should only be considered in selected and closely monitored people with advanced heart failure or proteinuric nephropathy (table 1). For people already on the combination and stable, clinicians need to consider that prescribing just one of the two 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 trial found large reductions in cardiovascular events and mortality in the treatment of hypertension in quite healthy but very elderly people (over age 80)<sup>32</sup>. Hence CHEP now specifically recommends that age not be used as a factor in prescribing pharmacotherapy for hypertension [CHEP 2009 Recommendations submitted to CJC for publication]. 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. People where the risk may outweigh the benefit could include those with postural hypotension, post prandial hypotension and people who have a poor short term prognosis due to competing co-morbidity.

Other major clinical trials with angiotensin receptor blocker based therapy to lower blood pressure were considered (PROFESS<sup>33</sup> and TRANSCEND<sup>34</sup>) but did not result in changes to the CHEP recommendations.

### **Home measurement of blood pressure**

CHEP continues to encourage home measurement of blood pressure as a step towards 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>35</sup>. Patient instructions for purchasing and using home blood pressure measurement can be found at [www.hypertension.ca](http://www.hypertension.ca) and [www.heartandstroke.ca/BP](http://www.heartandstroke.ca/BP). In 2009 a home measurement instructional DVD will be available for download from the hypertension.ca site. General sources for patient information on home measurement of blood pressure can be found in Table 2.

### **Other important recommendations for the management of the patient with hypertension:**

***Assess blood pressure at all appropriate visits.*** Blood pressure increases with age such that 50% of Canadians over age 65 have hypertension. For those with normal blood pressure at age 55-65, over 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 in all people with hypertension including: smoking, dyslipidemia and dysglycemia (e.g. glucose intolerance, diabetes), abdominal obesity, unhealthy eating and physical inactivity.** The vast majority of Canadians with hypertension have other cardiovascular risks. Identifying and managing risk factors in addition to hypertension can double the risk reduction in cardiovascular disease, can alter the blood pressure target (Table 3) and specific classes of medications recommended (Table 1). Currently only one 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 risks (male, sedentary behaviour, poor dietary habits, obesity, smoking etc.) are recommended to be considered for pharmacotherapy [CHEP 2009 Recommendations submitted to CJC for publication]. In general, people with hypertension who smoke and cannot quit are recommended to be prescribed antihypertensive therapy, although a beta-blocker 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 (CVD).** Hypertension can be prevented and treated, and other cardiovascular risks reduced, through healthy eating, regular physical activity, low risk alcohol consumption, reductions in dietary sodium and in some, stress reduction (Table 4). Unfortunately after a diagnosis of hypertension, few Canadians improve their lifestyle<sup>8</sup>. However, simple, brief health care professional interventions increase the probability of a patient making lifestyle changes<sup>36</sup>. Table 5 provides tips that can be used to

advise people on how to reduce dietary sodium. Table 6 outlines internet resources that can assist people self management 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 hypertensive patient's lifestyles and provides individualized approaches and monitoring to assist lifestyle changes. Several patient handouts on hypertension can also be ordered from [www.hypertension.ca/bpc](http://www.hypertension.ca/bpc).

**Treat to target (<140/90 mmHg; <130/80 mmHg in people with diabetes or chronic kidney disease).** Greater reduction in cardiovascular disease is achieved by lowering the blood pressure to the stated targets (Table 3). In people with diabetes and hypertension, lowering blood pressure to less than 130/80 mmHg markedly decreases cardiovascular death and hospitalization.

*Combinations of therapies (both drug and lifestyle) are generally necessary to achieve target blood pressures.* Most people require multiple antihypertensive drugs as well as lifestyle changes. When using two drugs to lower blood pressure combinations of a beta blocker, ACE inhibitor or angiotensin receptor blocker produce less than additive hypotensive effect and should be avoided unless there is a specific indication. If blood pressure is  $\geq 20/10$  mmHg above target initiating therapy with a combination of two '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 improves patient adherence and is required 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 non adherence and improve adherence in those who are having problems (Table 7).

### **Comments from the CHEP executive**

CHEP 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 CHEP is working closely with Blood Pressure Canada to develop and disseminate patient information on hypertension to improve patient self efficacy in managing hypertension. A major recent activity has been to develop 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>37</sup> and could save over 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 major health risk to Canadians<sup>6</sup>. Two thirds of diabetic Ontarians (and likely other Canadians) 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 numbers of cardiovascular risks younger hypertensive Canadians have does not impact on 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, the majority has

multiple cardiovascular risk factors and are strong candidates for pharmacotherapy. Perhaps, even more concerning is that after being diagnosed with hypertension, Canadian people only make very minor improvements in lifestyle and on average even gain weight<sup>8</sup>. More emphasis on lifestyle change is required. Hopefully health care reform with an increase in primary health care teams will have a substantial impact on improving lifestyles of Canadians with hypertension.

A detailed survey of Canadians with hypertension is being conducted in 2009 to determine their knowledge, attitudes, beliefs and behaviors and in 2010 the results of a national blood pressure survey will indicate the Canadian rate 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 mean time Blood Pressure Canada has developed a new resource to aid interdisciplinary health care professional teams 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))

In 2009, a national strategy for prevention and control 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. CHEP anticipates that if implemented the strategy will lead to greater government involvement and a much greater reduction in cardiovascular disease in Canada.

The CHEP executive would like to thank the over 100 health care professional volunteers, many of whom spend hundreds of hours each year and have been involved for a decade now in developing, disseminating and evaluating the annual Canadian recommendations for the management of hypertension (Table 8). The collaborative approach of volunteers from clinic practice, 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 hypertensive Canadians<sup>6</sup>.


**Table 1: Considerations in the Individualization of Antihypertensive Therapy**

ACE Angiotensin-converting enzyme; TIA transient ischemic attack; ARB angiotensin II receptor blocker (With permission of CHEP.)

	<i>Initial therapy</i>	<i>Second-line therapy</i>	<i>Notes and/or Cautions</i>
<b>HYPERTENSION WITHOUT OTHER COMPELLING INDICATIONS</b>			
		<b>TARGET &lt; 140/90 mmHg</b>	
Diastolic+/- Systolic Hypertension	Thiazide diuretics, beta blockers, ACE-inhibitors, ARBs, or long-acting calcium channel blockers (consider ASA and statins in selected people). Consider initiating therapy with a combination of two first line drugs if the blood pressure is $\geq 20$ mmHg systolic or $\geq 10$ mmHg diastolic above target.	Combinations of first-line drugs	Beta-blockers are not recommended as initial therapy in those over 60 years of age. Hypokalemia should be avoided by using potassium-sparing agents in those who are prescribed diuretics as monotherapy. ACE inhibitors are not recommended as monotherapy in blacks. ACE inhibitors, ARBs and direct rennin inhibitors are potential teratogens and caution is required if prescribing to women of child bearing potential. Combination of an ACE-inhibitor with an ARB is specifically not recommended.
Isolated systolic hypertension without other compelling indications	Thiazide diuretics, ARBs or long-acting dihydropyridine calcium channel blockers.	Combinations of first-line drugs	Same as diastolic+/- systolic Hypertension
<b>DIABETES MELLITUS</b>			
		<b>TARGET &lt; 130/80 mmHg</b>	
Diabetes mellitus with nephropathy	ACE inhibitors or ARBs	Addition of thiazide diuretics, cardioselective beta-blockers, long-acting calcium channel blockers	If the serum creatinine level is $>150$ $\mu\text{mol/L}$ , a loop diuretic should be used as a replacement for low-dose thiazide diuretics if volume control is required
Diabetes mellitus without nephropathy	ACE inhibitors, ARBs, dihydropyridine CCBs or thiazide diuretics	Combination of first-line drugs or if first line agents are not tolerated addition of cardioselective beta-blockers and/or long-acting non dihydropyridine calcium channel blockers	Normal albumin to creatinine ratio [ACR] $< 2.0$ mg/mmol in men and $< 2.8$ mg/mmol in women Combination of an ACE-inhibitor with an ARB is specifically not recommended.
<b>CARDIOVASCULAR AND CEREBROVASCULAR DISEASE</b>			
		<b>TARGET &lt; 140/90 mmHg</b>	
Angina	Beta-blockers; ACE inhibitors except in low risk patients	Long-acting calcium channel blockers	Avoid short-acting nifedipine. Combinations of an ACE-inhibitor with an ARB is specifically not recommended.
Prior myocardial infarction	Beta-blockers and ACE inhibitors (ARBs if ACEI- intolerant)	Long-acting calcium channel blockers	Combination of an ACE-inhibitor with an ARB is specifically not recommended.
Heart failure	ACE inhibitors (ARBs if ACEI- intolerant) and beta-blockers. Spironolactone in patients with NYHA class III or IV symptoms.	ARB in addition to ACE inhibitor. Hydralazine/isosorbide dinitrate combination Thiazide or loop diuretics, are recommended as additive therapy	Titrate doses of ACEI and ARB to those used in clinical trials. Avoid nondihydropyridine calcium channel blockers (diltiazem, verapamil). Monitor potassium and renal function if combining an ACE inhibitor with ARB.
Left ventricular hypertrophy	Does not affect initial treatment recommendations	Combinations of additional agents	Hydralazine and minoxidil can increase left ventricular hypertrophy.
Past cerebrovascular accident or TIA	ACE inhibitor/diuretic combinations	Combinations of additional agents	This does not apply to acute stroke. Blood pressure reduction reduces recurrent cerebrovascular events in stable patients. Combination of an ACE-inhibitor with ARB is specifically not recommended.
<b>NON DIABETIC CHRONIC KIDNEY DISEASE</b>			
		<b>TARGET &lt; 130/80 mmHg</b>	
Non diabetic chronic kidney disease	ACE inhibitors (or ARBs if ACEI- intolerant) if there is proteinuria Diuretics as additive therapy	Combinations of additional agents	Avoid ACE inhibitors or ARB if bilateral renal artery stenosis or unilateral disease with solitary kidney. Patients placed on an ACE inhibitor or an ARB should have their serum creatinine and potassium carefully monitored. Combinations of an ACE-inhibitor and ARB is specifically not recommended in people with chronic kidney disease without proteinuria
Renovascular disease	Does not affect initial treatment recommendations	Combinations of additional agents	Avoid ACE inhibitors or ARB if bilateral renal artery stenosis or unilateral disease with solitary kidney.
<b>OTHER CONDITIONS</b>			
		<b>TARGET &lt; 140/90 mmHg</b>	
Peripheral arterial disease	Does not affect initial treatment recommendations	Combinations of additional agents	Avoid beta-blockers with severe disease
Dyslipidemia	Does not affect initial treatment recommendations	Combinations of additional agents	
Overall vascular protection	Statin therapy for people with 3 or more cardiovascular risk factors or with atherosclerotic disease Low dose ASA in people with controlled blood pressure		Caution should be exercised with the ASA recommendation if blood pressure is not controlled.

## Table 2: Patient instructions to prepare for home blood pressure measurement

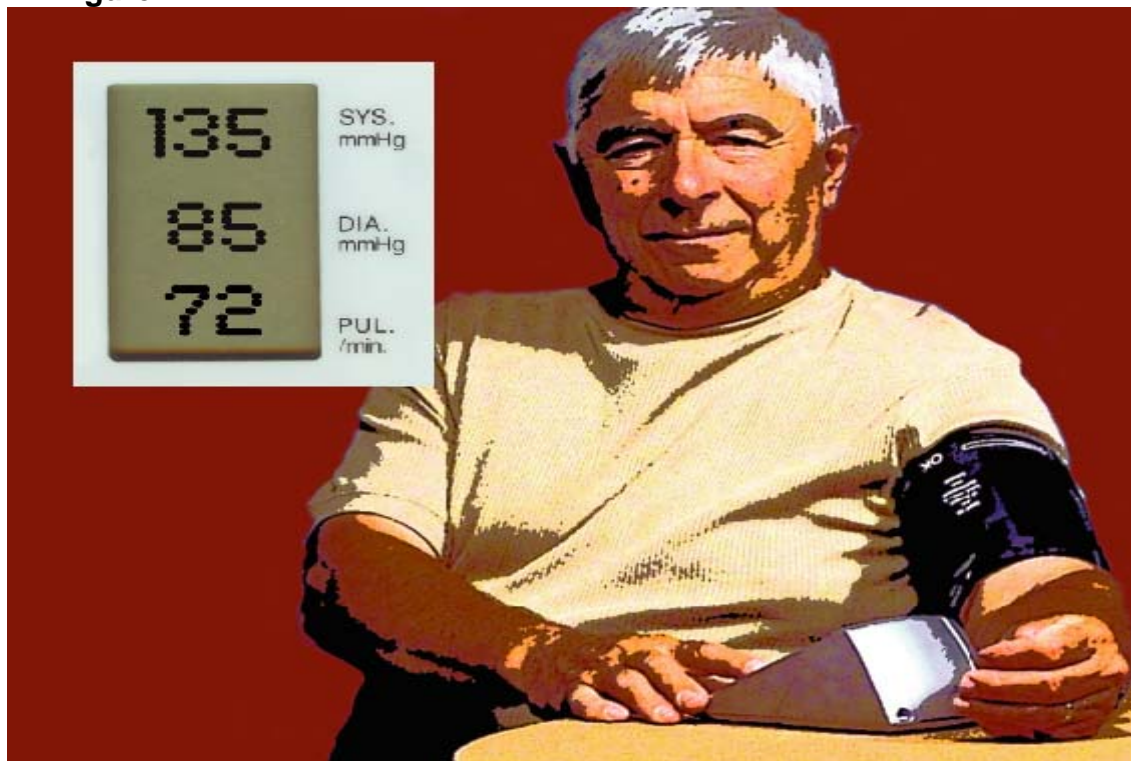
### Purchasing Equipment

- Buy an approved machine marked by the  logo
- Make sure the device has a cuff size that is correct for you. Ask for help if you are unsure.

To measure blood pressure -

- Follow the directions that come with the device.
- Only measure and record blood pressure if you have time to do it correctly.
- Do not measure blood pressure when you are uncomfortable, cold, anxious, stressed or in pain.
- Wait for at least two hours after heavy physical activity (e.g. long run) and at least half an hour after light physical activity (e.g. short walk), drinking coffee or smoking.
- Empty your bladder or bowels if uncomfortable before taking a reading.
- It is very important to rest and relax for 5 minutes in a quiet comfortable place with no distractions (e.g. TV or talking) before measuring your blood pressure.
- Put the cuff on a bare arm or one that has a thin sleeve
- Sit in a chair that supports your back and beside a table that can support your arm. If required put a pillow or towel under your arm so that it rests at heart level (see Figure). Do not cross your legs.
- Measure blood pressure in the morning before medications and eating and in the evening before going to bed, bathing or taking medications.
- Take at least two readings and record them with the date and time.

Figure



**Table 3: Target Values for Blood Pressure**

<b>Setting</b>	<b>Target (SBP/DBP mmHg)</b>
<b>Home:</b>	
Home blood pressure and daytime ABPM*	<135/85
<b>Office:</b>	
Diastolic ± <b>systolic</b> hypertension	<140/90
Isolated <b>systolic</b> hypertension	<b>&lt;140</b>
Diabetes	<130/80
Chronic kidney disease	<130/80

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\* The target value readings taken by home measurement and ABPM in those with diabetes or chronic kidney disease have not been established.

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**Table 4: Lifestyle therapy to reduce the possibility of becoming hypertensive and to reduce blood pressure and to reduce the risk of blood pressure-related cardiovascular complications in people with hypertension.**

1. Healthy diet: high in fresh fruits and vegetables, low fat dairy products, dietary and soluble fibre, whole grains and protein from plant sources, low in saturated fat, cholesterol and salt in accordance with Canada's Guide to Healthy Eating
2. Regular physical activity: accumulation of 30-60 minutes of moderate intensity dynamic exercise 4-7 days per week in addition to daily activities.
3. Low risk alcohol consumption ( $\leq 2$  standard drinks/day and less than 14/week for men and less than 9/week for women)
4. Attaining and maintaining ideal body weight (BMI 18.5-24.9 kg/m<sup>2</sup>)
5. A waist circumference

Europid	< 94 cm for men
	< 80 cm for women
South Asian, Japanese,	< 90 cm for men
Chinese	< 80 cm for women
6. Reduction in sodium intake to less than 2300 mg/day
7. A smoke free environment

With permission of the Canadian Hypertension Education Program

## **Table 5: Advice for People to Assist them to Reduce Dietary Sodium**

### **DO**

- Buy and eat more fresh foods especially fruit and vegetables
- Choose processed foods with low salt labels or brands with the lowest percentage of sodium on the food label
- Wash canned foods or other salty foods in water before eating or cooking
- If desired, use unsalted spices to make foods taste better
- Eat less food at restaurants and fast food outlets and ask for less salt to be added in your food orders
- Use less sauces on your food
- Eat foods with less than 200 mg of sodium or less than 10% of the daily value per serving

### **DON'T**

- Buy or eat heavily salted foods (e.g. pickled foods, salted crackers or chips, processed meats, etc).
- Add salt in cooking and at the table
- Eat foods with more than 400 mg of sodium or more than 20% of the daily value per serving

With permission of Blood Pressure Canada

**Table 6: Internet Resources for Patient Information\***

<b>Resource</b>	<b>Description</b>	<b>Source</b>
<b>2008 Patient Hypertension Recommendations</b>	<ul style="list-style-type: none"> <li>• <i>General information on prevention and treatment of hypertension</i></li> </ul>	<a href="http://www.hypertension.ca/bpc">www.hypertension.ca/bpc</a>
<b>2009 Patient Hypertension Recommendations</b>	<ul style="list-style-type: none"> <li>• <i>Specific information on the management of hypertension in the diabetic patient</i></li> </ul>	<a href="http://www.hypertension.ca/bpc">www.hypertension.ca/bpc</a>
<b>Diabetes &amp; Hypertension</b>	<ul style="list-style-type: none"> <li>• <i>Information on hypertension for people with diabetes</i></li> </ul>	<a href="http://www.diabetes.ca">www.diabetes.ca</a>
<b>On-line, personalized blood pressure plan DASH diet</b>	<ul style="list-style-type: none"> <li>• <i>Create a personalized action plan for healthy living</i></li> <li>• <i>The DASH diet and healthy eating to improve blood pressure control</i></li> </ul>	<a href="http://www.heartandstroke.ca/bp">www.heartandstroke.ca/bp</a> <a href="http://www.nhlbi.nih.gov/hbp/prevent/h_eating/h_eating.htm">www.nhlbi.nih.gov/hbp/prevent/h_eating/h_eating.htm</a>
<b>Canada's Food Guide</b>	<ul style="list-style-type: none"> <li>• <i>Canada's official guide to healthy eating and lifestyle choices. Personalize your own food guide!</i></li> </ul>	<a href="http://www.hc-sc.gc.ca/fn-an/food-guide-aliment/index_e.html">www.hc-sc.gc.ca/fn-an/food-guide-aliment/index_e.html</a>
<b>Dietitians of Canada</b>	<ul style="list-style-type: none"> <li>• <i>Tips for eating well and living well</i></li> </ul>	<a href="http://www.dietitians.ca">www.dietitians.ca</a>
<b>On-line health and fitness calculators</b>	<ul style="list-style-type: none"> <li>• <i>Learn about your risk factors using different tools to calculate your personal factors</i></li> </ul>	<a href="http://www.healthtoolsonline.com/health-fit.html">www.healthtoolsonline.com/health-fit.html</a>

Many of the resources can be downloaded and printed or hard copies ordered for people who do not use the internet. With permission of Blood Pressure Canada

**Table 7: Strategies to Improve Patient Adherence\***

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1) Assist your patient to adhere

- i)** Tailoring pill-taking to fit patients' daily habits
  - ii)** Simplifying medication regimens to once-daily dosing
  - iii)** Replacing 2 antihypertensive agents with a fixed dose combination (where available and appropriate), provided it is the same combination the patient is already taking
  - iv)** Utilizing unit-of-use packaging (of several medications to be taken together)
  - v)** Identify potential barriers to adherence
- 

2) Assist your patient in getting more involved in their treatment

- vi)** Encouraging greater patient responsibility/autonomy in monitoring their blood pressure and adjusting their prescriptions
- vii)** Educating patients and patients' families about their disease/treatment regimens

3) Improve your management in the office and beyond

- viii)** Assessing adherence to pharmacological and non-pharmacological therapy at every visit
  - ix)** Encouraging adherence with therapy by out of office contact (either by phone or mail), particularly over the first three months of therapy
  - x)** Coordinating with work-site healthcare givers to improve monitoring of adherence with pharmacological and lifestyle modification prescriptions
  - xi)** Utilizing electronic medication compliance aids
  - xii)** Adherence to an antihypertensive prescription can be improved by a multidisciplinary team approach
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**Table 8: The Canadian Hypertension Education Program**

Steering committee	Blood Pressure Canada
	Canadian Council of Cardiovascular Nurses
	Canadian Hypertension Society
	Canadian Pharmacists Association
	College of Family Physicians of Canada
	Heart and Stroke Foundation of Canada
	Public Health Agency of Canada
Volunteers	Over 100 volunteers from clinical practice, academia and government
Evidence based	Recommendations Task Force with over 50 clinical and academic volunteers
	Centered around a core group of evidence based medicine experts who do not have potential commercial conflicts of interest
Knowledge translation	Implementation Task Force with over 25 volunteers from nursing, pharmacy, family medicine and health education to translate the recommendations to meet discipline specific needs and to facilitate inter disciplinary care
Outcomes evaluation	Outcomes Research Task Force with over 40 volunteers from academia and government to assess the impact of the program on an ongoing basis
Administrative support	Susan Carter at Debut Medical Education
Patient oriented	Close association with Blood Pressure Canada to develop patient resources for self efficacy and knowledge translation

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