

# Tables 1–6, Boxes 1–3, Figure 1

## 2010 Canadian Hypertension Education Program recommendations

*An annual update*

On behalf of the Canadian Hypertension Education Program  
*Can Fam Physician* 2010;56:649–53

**Table 1. Resources for health care professionals and their patients:** Resources can be downloaded from [www.hypertension.ca/tools](http://www.hypertension.ca/tools) and [www.lowersodium.ca](http://www.lowersodium.ca); those who sign up at [www.htnupdate.ca](http://www.htnupdate.ca) will automatically be notified when resources are updated or developed.

RESOURCES	DESCRIPTION
<b>Physician resources</b>	
Written documents	
• CHEP primary care booklet	Brief outline of hypertension management recommendations in a pocket booklet
• Key messages	The 6 important actions required by health care professionals to prevent and control CVD in people with hypertension
• Key messages on sodium	Messages on the importance of lowering dietary sodium, with brief intervention advice
• Clinical summary	A brief narrative of current CHEP clinical recommendations
• Scientific summary	A brief narrative of what is new and important, with an emphasis on the scientific basis of the CHEP recommendations
• Scientific summary on dietary sodium	Short narrative on the importance of reducing dietary sodium, with advice on how to reduce intake and the evidence-base for lowering dietary sodium
• CHEP specialist booklet	Short scientific summary and exact CHEP recommendations in a pocket booklet
• Full scientific manuscripts	Detailed manuscripts that indicate exact CHEP scientific recommendations for the management of hypertension, with their scientific rationale
PowerPoint slides	
• Public education slide set	Used to develop general discussion on hypertension with a public or patient audience
• Background slide set	Contains information on the health risks of hypertension and key therapeutic interventions
• Methodology slide set	Outlines the methods CHEP uses to develop its recommendations as well as the key messages and themes for 2010
• Diagnostic slide set	Outlines the diagnostic recommendations of CHEP as well as the key messages and themes for 2010
• Treatment slide set	Outlines the treatment recommendations of CHEP as well as the key messages and themes for 2010
• BP measurement slide set	Outlines the measurement recommendations for BP and includes advice on office, home, and ambulatory BP measurement
• Outcomes slide set	Outlines the various surveillance methods used by CHEP as well as key outcomes associated with CHEP; ongoing hypertension management gaps are featured
• Hypertension slide set	A new set of slides that outline the Canadian hypertension resources available
• Dietary sodium slide set	2 sets are available: one intended to be used to develop discussion with a clinical or scientific audience and the other intended for a public and patient audience

*Table 1 continues*

Table 1 continued

Websites	
• <a href="http://www.hypertension.ca/tools">www.hypertension.ca/tools</a>	Download current resources for health care professionals and patients
• <a href="http://www.htnupdate.ca">www.htnupdate.ca</a>	Sign up to be regularly advised of new and updated resources for care professionals and patients, as well as educational opportunities for health care professionals
• <a href="http://www.lowersodium.ca">www.lowersodium.ca</a>	Educational resources for health care professionals and patients regarding dietary sodium
<b>Patient resources</b>	
Documents	
• Clinical summary	A single-page brochure that summarizes hypertension and its management for those with the disease or those at risk; the summary is based on the 2010 CHEP health care professional management recommendations
• Hypertension recommendations	A 4-page summary of hypertension and its management for those with the disease or those at risk; the summary is based on the 2010 CHEP health care professional management recommendation. The 2007 recommendations are available in 4 Indo-Asian languages and cultural translations
• BP summaries	A 1-page summary and a more detailed 4-page summary of how to purchase and use a home BP measurement device
• Action tools	A set of 3 tools to be used by health care professionals to engage patients more fully in self-care: Action tool 1 takes about 4 minutes to complete and defines BP, explains why patients need to be concerned about high BP values, and outlines the risks of hypertension; action tool 2 takes 10 minutes and is used to motivate patients to make lifestyle changes; action tool 3 takes 7 minutes and encourages home measurement and recording of BP, and provides information on BP medication
• Postcard	A poster and small card that outline pictorially the key steps to measuring BP at home
• Dietary sodium fact sheet and summary	A 1-page summary of the importance of reducing dietary sodium and key mechanisms to reduce dietary sodium
• Dietary sodium booklet	A more detailed summary of why it is important to reduce dietary sodium and how to reduce dietary sodium for the more interested consumer
• Dietary sodium brochure	Going beyond the salt shaker, this brochure advises on how to lower sodium intake and improve general health
PowerPoint slides	
• Public education hypertension slide set	Slides that are intended to be used by a knowledgeable health care professional in developing a presentation on hypertension to the public or to patients with hypertension
• Dietary sodium slide set	Slides that are intended to be used by a knowledgeable health care professional in developing a presentation on dietary sodium to the public or patients with hypertension
• Quiz	A short series of questions and answers in a PowerPoint format for patients to use in public discussion to test their sodium knowledge
DVDs	
• "Hypertension—The Silent Killer"	A short and longer summary of hypertension for patients with hypertension or those at risk
• Home BP measurement	An audiovisual aid to measuring BP at home, as well as how to purchase and use home BP measurement devices
Websites	
• <a href="http://www.myBPsite.ca">www.myBPsite.ca</a>	Join a hypertension association and be regularly updated on hypertension resources and materials
• <a href="http://www.hypertension.ca/bpc">www.hypertension.ca/bpc</a>	Download patient-related resources
• <a href="http://www.hypertension.ca/chs">www.hypertension.ca/chs</a>	Summary of different home measurement devices that have passed international accuracy standards, are available in Canada, and have been approved by the CHS
• <a href="http://www.lowersodium.ca">www.lowersodium.ca</a>	Patient and health care professional information on dietary sodium
• <a href="http://www.sodium101.ca">www.sodium101.ca</a>	Public information on dietary sodium
• <a href="http://www.heartandstroke.ca/bp">www.heartandstroke.ca/bp</a>	Individualized action plans for lifestyle changes and BP monitoring
• <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>	Detailed information on adopting the DASH eating plan

BP—blood pressure, CHEP—Canadian Hypertension Education Program, CHS—Canadian Hypertension Society, CVD—cardiovascular disease, DASH—dietary approaches to stop hypertension.

**Table 2. Considerations in the individualization of antihypertensive therapy**

CONDITIONS	INITIAL THERAPY	SECOND-LINE THERAPY	ADDITIONAL NOTES
<b>Hypertension without other compelling indications—Target BP &lt; 140/90 mm Hg</b>			
Diastolic hypertension with or without systolic hypertension	Thiazide diuretics, $\beta$ -blockers, ACE inhibitors, ARBs, or long-acting CCBs (consider ASA and statins in selected patients). Consider initiating therapy with a combination of 2 first-line drugs if BP is $\geq 20$ mm Hg systolic or $\geq 10$ mm Hg diastolic above target	Combinations of first-line drugs	$\beta$ -Blockers are not recommended initial therapy in those > 60 y. Hypokalemia should be avoided by using potassium-sparing agents for those who are prescribed diuretics as monotherapy. ACE inhibitors are not recommended as monotherapy for black patients. ACE inhibitors, ARBs, and direct rennin inhibitors are potential teratogens and caution is required if prescribing to women with childbearing potential. Combination of ACE inhibitors with ARBs is specifically not recommended
Isolated systolic hypertension without other compelling indications	Thiazide diuretics, ARBs, or long-acting dihydropyridine CCBs	Combinations of first-line drugs	Same as above
<b>Diabetes mellitus—Target BP &lt; 130/80 mm Hg</b>			
Diabetes mellitus with albuminuria*	ACE inhibitors or ARBs	Addition of thiazide diuretics, cardioselective $\beta$ -blockers, or long-acting CCBs	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 albuminuria*	ACE inhibitors, ARBs, dihydropyridine CCBs, or thiazide diuretics	Combination of first-line drugs or, if those are not tolerated, addition of cardioselective $\beta$ -blockers or long-acting non-dihydropyridine CCBs	Normal albumin to creatinine ratio < 2.0 mg/mmol in men and < 2.8 mg/mmol in women. Combination of ACE inhibitors with ARBs is specifically not recommended
<b>Cardiovascular disease—Target BP &lt; 140/90 mm Hg</b>			
Coronary artery disease	ACE inhibitors or ARBs (except in low-risk patients); $\beta$ -blockers in patients with stable angina	Long-acting CCBs. When combination therapy is being used for high-risk patients, and ACE inhibitor-dihydropyridine CCB is preferred	Avoid short-acting nifedipine. Combination of ACE inhibitors with ARBs is specifically not recommended
Prior myocardial infarction	$\beta$ -blockers and ACE inhibitors (use ARBs in ACE inhibitor-intolerant patients)	Long-acting CCBs	Combination of ACE inhibitors with ARBs is specifically not recommended
Heart failure	ACE inhibitors (ARBs if ACE inhibitor-intolerant) and $\beta$ -blockers; spironolactone in patients with NYHA class III or IV symptoms	ARBs in addition to ACE inhibitors. Hydralazine/isosorbide dinitrate (thiazide or loop diuretics as additive therapy)	Titrate doses of ACE inhibitors and ARBs to those used in clinical trials. Avoid non-dihydropyridine CCBs (diltiazem, verapamil). Monitor potassium and renal function if combining ACE inhibitors and ARBs
Left ventricular hypertrophy	Does not affect initial treatment recommendations	Combinations of additional agents	Hydralazine and minoxidil can increase left ventricular hypertrophy
Past stroke or TIA	ACE inhibitor and diuretic combinations	Combinations of additional agents	This does not apply to acute stroke. BP reduction reduces recurrent cerebrovascular events in patients with stable past cerebrovascular disease. Combination of ACE inhibitors with ARBs is specifically not recommended
<b>Nondiabetic chronic kidney disease—Target BP &lt; 130/80 mm Hg</b>			
Nondiabetic chronic kidney disease with proteinuria†	ACE inhibitors (ARBs if ACE inhibitor-intolerant) if there is proteinuria.‡ Diuretics as additive therapy	Combinations of additional agents	Avoid ACE inhibitors or ARBs in patients with bilateral renal artery stenosis or unilateral disease with solitary kidney. Patients taking ACE inhibitors or ARBs should have their serum creatinine and potassium carefully monitored. Combination of ACE inhibitors and ARBs is specifically not recommended in patients with chronic kidney disease without proteinuria
Renovascular disease	Does not affect initial treatment recommendations	Combinations of additional agents	Avoid ACE inhibitors or ARBs in patients with bilateral renal artery stenosis or unilateral disease with solitary kidney
<b>Other conditions—Target BP &lt; 140/90 mm Hg</b>			
Peripheral arterial disease	Does not affect initial treatment recommendations	Combinations of additional agents	Avoid $\beta$ -blockers in patients with severe onset of disease
Dyslipidemia	Does not affect initial treatment recommendations	Combinations of additional agents	None
Overall vascular protection	Statin therapy in patients with 3 or more cardiovascular risk factors or with atherosclerotic disease. Low-dose ASA in patients with controlled BP	None	Caution should be exercised with the ASA recommendation if BP is not controlled

ACE—angiotensin-converting enzyme, ARB—angiotensin II receptor blocker, ASA—acetylsalicylic acid, BP—blood pressure, CCB—calcium channel blocker, NYHA—New York Heart Association, TIA—transient ischemic attack.

\*Albuminuria is defined as a persistent albumin to creatinine ratio of > 2.0 mg/mmol in men and > 2.8 mg/mmol in women.

†Proteinuria is defined as a 24-hour urine total protein level of > 500 mg or an albumin to creatinine ratio of > 30 mg/mmol.

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**Table 3. Target values for dietary sodium:** *To prevent and control hypertension adults should be advised to eat the level recommended as adequate intake and avoid eating more than the upper limit.*

AGE, Y	ADEQUATE INTAKE, MG	UPPER LIMIT, MG
19 to 30	1500	2300
31 to 50	1500	2300
51 to 70	1300	2300
71 and older	1200	2300

Data from Khan et al.<sup>19</sup>

**Table 4. Target values for blood pressure:** *Office measurement values vary depending on certain conditions.*

SETTING	TARGET (MM HG)
<b>Home</b>	
• Home blood pressure and daytime ABPM*	< 135/85
<b>Office</b>	
• Diastolic hypertension with or without systolic hypertension	< 140/90
• Isolated systolic hypertension	< 140
• Diabetes	< 130/80
• Chronic kidney disease	< 130/80

ABPM—ambulatory blood pressure monitoring.

\*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 5. Lifestyle therapies to reduce the possibility of becoming hypertensive, reduce blood pressure, and reduce the risk of blood pressure–related cardiovascular complications in people with hypertension**

INTERVENTION
A healthy diet high in fresh fruits, vegetables, low-fat dairy products, dietary and soluble fibre, whole grains, and protein from plant sources; and low in saturated fat, cholesterol, and salt in accordance with Canada's Guide to Healthy Eating
Regular physical activity: accumulation of 30–60 min of moderate intensity dynamic exercise 4–7 d/wk in addition to daily activities
Low-risk alcohol consumption ( $\leq 2$ standard drinks/d; $< 14$ /wk for men and $< 9$ /wk for women)
Attaining and maintaining ideal body weight (BMI of 18.5–24.9 kg/m <sup>2</sup> )
A waist circumference of <ul style="list-style-type: none"> <li>• <math>&lt; 94</math> cm for men of European ancestry</li> <li>• <math>&lt; 80</math> cm for women of European ancestry</li> <li>• <math>&lt; 90</math> cm for men of South Asian, Japanese, or Chinese ancestry</li> <li>• <math>&lt; 80</math> cm for women of South Asian, Japanese, or Chinese ancestry</li> </ul>
Reduction in sodium intake to $< 1500$ mg/d for adults if under the age of 50; $< 1300$ mg/d if between the ages of 51 and 70; $< 1200$ mg/d if older than age 70*
A smoke-free environment

BMI—body mass index.

\*Lower levels of intake in children are recommended by the Canadian government.


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**Table 6. The team and elements of the Canadian Hypertension Education Program**

TEAM OR ELEMENTS	DETAILS
Team	
• Steering committee	Representatives from 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	More than 100 volunteers from clinical practice, academia, and government; Recommendations Task Force, with more than 50 clinical and academic volunteers
• Administrative support	Susan Carter at Debut Medical Education
Elements	
• Evidence-based	Centred on a core group of evidence-based medicine experts who do not have potential commercial conflicts of interest
• Knowledge translation	Implementation Task Force, with more than 25 volunteers from nursing, pharmacy, family medicine, and health education to translate the recommendations to meet discipline-specific needs and to facilitate interdisciplinary care
• Outcomes evaluation	Outcomes Research Task Force, with more than 40 volunteers from academia and government to assess the effects of the program on an ongoing basis
• Patient-oriented	Close association with Blood Pressure Canada to develop patient resources for self-efficacy and knowledge translation

### **Box 1. Patient instructions for home BP 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

#### Measuring BP

- Follow the directions that come with the device
- Only measure and record BP if you have time to do it correctly
- Do not measure blood pressure when you are uncomfortable, cold, anxious, stressed, or in pain
- Wait at least 2 hours after heavy physical activity (eg, a long run) and at least a half hour after light physical activity (eg, a short walk), drinking coffee, or smoking
- Empty your bladder or bowels if experiencing discomfort before taking a reading
- It is very important to rest and relax for 5 minutes in a quiet, comfortable place, with no distractions (eg, TV or talking) before measuring your BP
- 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 (Figure 1). Do not cross your legs
- Measure BP in the morning before taking medications or eating and in the evening before going to bed, bathing, or taking medications
- Take at least 2 readings and record them with the date and time

BP—blood pressure.

### **Box 2. Ways to reduce intake of dietary sodium**

#### Do

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

#### Do not

- Buy or eat heavily salted foods (eg, pickled foods, salted crackers or chips, processed meats)
- 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

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### Box 3. Strategies to improve patient adherence

#### Assist patients in adherence

- Tailor pill-taking to fit patients' daily habits
- Simplify medication regimens to once-daily doses
- Replace 2 antihypertensive agents with a fixed-dose combination (where available and appropriate), provided it is the same combination the patient is already taking
- Use unit-of-use packaging (ie, several medications to be taken together)
- Identify potential barriers to adherence

#### Help patients become more involved in their treatment

- Encourage greater responsibility or autonomy among patients in monitoring their blood pressure and adjusting their prescriptions
- Educate patients and patients' families about their disease and treatment regimens

#### Improve your management in the office and beyond

- Assess adherence to pharmacologic and nonpharmacologic therapy at every visit
- Encourage adherence with therapy by out-of-office contact (either by telephone or mail), particularly over the first 3 months of therapy
- Coordinate with health care providers at patients' work sites to improve monitoring of adherence with pharmacologic and lifestyle modification prescriptions
- Use electronic medication compliance aids
- Use a multidisciplinary team approach

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Figure 1. Proper position to measure blood pressure



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