2011

Canadian Recommendations for the Management of Hypertension

What’s New, What’s Old But Still Important
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Are you and your patients armed with the latest hypertension management resources?
Sign up at www.htnupdate.ca to be notified by email when new resources are developed or updated for you or your patients or download current resources at www.hypertension.ca/tools/. In 2011, a case based interactive lecture series on clinically important hypertension topics will be launched. Your patients can also sign up at myBP www.mybpsite.ca for 2011 annual membership where they will receive email notices of updated and new educational resources.

A Call to Action! 2011 CHEP Theme
Clinicians and scientists need to advocate for public policies to advance the health of Canadians through improved prevention and control of hypertension. By aligning health care professionals, their organizations and various levels of government to work on a common policy agenda it is believed substantive progress can be made to further prevent and control hypertension. For more information, visit www.hypertension.ca (Public Policy Committee).

What is New in 2011?
Most people with diabetes die of cardiovascular disease. Many of the specific diabetic complications are attributable to elevated blood pressure and more vs. less intensive blood pressure management has been shown to have large effects on total and cardiovascular mortality.

In 2010, new clinical trial data became available to address the systolic blood pressure targets and several authors have called for a less intensive systolic blood pressure target however, on the basis of the available evidence, CHEP recommends sustaining the blood pressure target of less than 130/80mmHg. Combination therapy using two first-line agents may also be considered as initial treatment of hypertension if systolic blood pressure is 20 mmHg above target or if diastolic blood pressure is 10 mmHg above target. However, caution should be exercised in patients in whom a substantial fall in blood pressure is more likely or poorly tolerated (eg, elderly patients and patients with autonomic neuropathy). For persons in whom combination therapy with an ACE inhibitor is being considered, a dihydropyridine CCB is preferable to a thiazide or thiazide-like diuretic.

Hypertension in Stroke
Blood pressure frequently increases in the setting of acute stroke and both very high and low blood pressure levels are associated with poor patient outcomes in the acute setting. There is little quality evidence to guide blood pressure lowering in the setting of acute stroke with concerns being expressed that treatment and lack of treatment may cause harm. For 2011, CHEP has collaborated with the Canadian Stroke Network to create a set of recommendations to guide management of hypertension in acute stroke as well as for ongoing management for secondary prevention.

New Tips for Improving Adherence
Coordinate with pharmacists and work-site healthcare givers to improve monitoring of adherence with pharmacological and lifestyle modification prescriptions. Consider informing patients of their global risk to improve the effectiveness of risk factor modification. Consider also using analogies that describe comparative risk such as “Cardiovascular Age”, “Vascular Age” or “Heart Age” to inform patients of their risk status.

Home blood pressure measurement assists in blood pressure control
• Provides a more accurate estimate of hypertension-related cardiovascular risk
• Allows expedited diagnosis of hypertension
• Helps to identify white coat and masked hypertension
• Improves medication adherence

The Heart and Stroke Foundation’s e-health tool, “My Heart&Stroke Blood Pressure Action Plan™” is an interactive patient tool that assesses risk factors and encourages positive steps towards better blood pressure management. It provides ongoing lifestyle change support and enables self-management that includes recording and monitoring blood pressure, medication and healthcare visits. It can be found at www.heartandstroke.ca/bp.

### Measure Blood Pressure in All Adults at All Appropriate Visits

<table>
<thead>
<tr>
<th>Elevated Out of the Office BP measurement</th>
<th>Elevated Random Office BP measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Hypertension Visit 1</strong> BP Measurement, History and Physical</td>
<td><strong>Hypertensive Urgency / Emergency</strong></td>
</tr>
<tr>
<td>Diagnostic test ordering at visit 1 or 2</td>
<td>YES</td>
</tr>
<tr>
<td><strong>Hypertension Visit 2</strong> within 1 month</td>
<td>Diagnosis of HTN</td>
</tr>
<tr>
<td>BP ≥140/90 mmHg and target organ damage or diabetes or chronic kidney Disease or BP ≥180/110?</td>
<td>NO</td>
</tr>
<tr>
<td><strong>BP: 140-179 / 90-109</strong></td>
<td></td>
</tr>
</tbody>
</table>

#### Clinic BP
- ≥160 SBP or ≥100 DBP → Diagnosis of HTN
- < 160/100 OR ABPM or Home BPM if available → ABPM (If available)

#### ABPM (If available)
- Awake BP <135/85 and 24-hour <130/80
- Awake BP ≥135 SBP or ≥85 DBP or 24-hour ≥130 SBP or ≥80 DBP

#### Home BPM (If available)
- <135/85
- ≥135 SBP or ≥90 DBP

- Continue to follow-up
- Diagnosis of HTN

If blood pressure is found to be high-normal (SBP 130-139 and or DBP 85-89), patients should be followed annually.
Treatment of Systolic/Diastolic Hypertension Without Other Compelling Indications

**Target <140/90 mmHg**

**Lifestyle modification**

**Initial drug therapy**

- Thiazide or thiazide-like diuretic
- ACE-I
- ARB
- Long-acting CCB
- Beta-blocker*

**Dual Combination**

**Triple or Quadruple Therapy**

*Not indicated as first line therapy over 60 y

**Combination Therapy**

To achieve optimal blood pressure targets:
- Multiple drug therapy is required in many patients.
- Most hypertensive patients with diabetes will require multi-drug therapy.
- Replace multiple antihypertensive agents with fixed-dose combination therapy.
- Low doses of multiple drugs may be more effective and better tolerated than higher doses of fewer drugs.
- Reassess patients with uncontrolled blood pressure at least every 2 months.
- A combination of two first-line agents may also be considered as initial treatment of hypertension if systolic blood pressure is 20 mmHg above target or if diastolic blood pressure is 10 mmHg above target.
- The combination of ACE inhibitors and ARBs should not be used.
- In selected high-risk patients in whom combination therapy is being considered, an ACE inhibitor plus a long-acting dihydropyridine CCB is preferable to an ACE inhibitor plus a thiazide or thiazide-like diuretic.

**Resistant Hypertension**

- Two-drug combinations of beta-blockers, ACE Inhibitors and angiotensin receptor blockers have not been proven to have additive antihypertensive effect. These potential drug combinations should not be used unless there is a compelling (non-blood pressure lowering) indication such as ischemic heart disease, post myocardial infarction, congestive heart failure or proteinuric renal disease.
- Consider white coat hypertension, white coat effect and non-adherence.
- Monitor creatinine and potassium when combining potassium sparing diuretics, ACE inhibitors, angiotensin receptor blockers and/or direct renin inhibitors.
- If not used as first-line or second-line therapy, triple dose therapy should include a diuretic when not contraindicated.
- Consider referral to a hypertension specialist if blood pressure is still not controlled after treatment with 3 antihypertensive medications.
**PRELIMINARY INVESTIGATIONS OF PATIENTS WITH HYPERTENSION**

1. Urinalysis
2. Blood chemistry (potassium, sodium and creatinine)
3. Fasting glucose
4. Fasting total cholesterol and high density lipoprotein cholesterol (HDL), low density lipoprotein cholesterol (LDL), triglycerides
5. Standard 12-lead ECG

Currently there is insufficient evidence, for or against, to recommend routine testing of microalbuminuria in patients with hypertension but without diabetes or renal disease.

**FOLLOW-UP INVESTIGATIONS OF PATIENTS WITH HYPERTENSION**

During the maintenance phase of hypertension management, tests (including electrolytes, creatinine, glucose, and fasting lipids) should be repeated with a frequency reflecting the clinical situation.

Diabetes develops in 1-3%/year of those with drug-treated hypertension. The risk is higher in those with one or more of the following: treated with a diuretic or beta-blocker, impaired fasting or impaired glucose tolerance, obesity (especially abdominal), dyslipidemia, sedentary lifestyle and poor dietary habits. Screen hypertensives with annual fasting plasma glucose testing and follow the screening recommendations. For diabetes management see: *Can J Diabetes*. 2008; 32(suppl 1):S1-S201

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**Lifestyle Recommendations for Prevention and Treatment Of Hypertension**

<table>
<thead>
<tr>
<th>Topic</th>
<th>Objective</th>
<th>Recommendation</th>
<th>BP Reduction</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Being More Physically Active</strong></td>
<td>An accumulation of 30-60 minutes of dynamic exercise of moderate intensity (such as walking, cycling, swimming) four to seven days per week in addition to the routine activities of daily living. Higher intensities of exercise are no more effective at BP lowering but may produce other cardiovascular benefits</td>
<td>Should be prescribed to both hypertensive and normotensive individuals for prevention and management of hypertension</td>
<td>-4.9/-3.7 mmHg</td>
</tr>
<tr>
<td><strong>Weight Reduction</strong></td>
<td>Attain/maintain a healthy BMI (18.5 - 24.9 kg/m²) and waist circumference (&lt;94 cm for men and &lt;80 cm for women) in all normotensive and hypertensive individuals for prevention/management of hypertension. (For people of South Asian and Chinese descent, waist circumference should be &lt;90 cm for men and &lt;80 cm for women.)</td>
<td>Encourage multidisciplinary approach to weight loss, including dietary education, increased physical activity and behavior modification</td>
<td>-7.2/-5.9 mmHg for every 4.5 kg weight loss</td>
</tr>
<tr>
<td><strong>Moderation in Alcohol Intake</strong></td>
<td>Limited consumption: 0-2 standard drinks/day Men: &lt; 14 drinks/week Women: &lt; 9 drinks/week</td>
<td>Should be prescribed to both hypertensive and normotensive individuals for prevention and management of hypertension</td>
<td>-3.9/-2.4 mmHg</td>
</tr>
<tr>
<td><strong>Eating Healthier and Reducing Sodium Intake</strong></td>
<td>DASH-like diet: ♦  High in fresh fruits, vegetables, dietary fibre, non-animal protein (e.g. soy) and low-fat dairy products. Low in saturated fat and cholesterol. ♦  Reduce dietary sodium to 1500 mg/day in adults age 50 and under, to 1300 mg/day in adults age 51 to 70 and to 1200 mg/day in adults older than 70 years.</td>
<td>Should be prescribed to both hypertensive and normotensive individuals for prevention/management of hypertension. Reducing sodium by 1800 mg/day</td>
<td>-11.4 / -5.5 mmHg for hypertensive -5.1/-2.7 mmHg</td>
</tr>
<tr>
<td><strong>Reducing Stress</strong></td>
<td>Individualized cognitive behavior interventions are more likely to be effective when relaxation techniques are employed</td>
<td>Stress management in selected patients</td>
<td>-6.1/-4.3 mmHg</td>
</tr>
<tr>
<td><strong>Smoking Cessation</strong></td>
<td>Abstinence from smoking. A smoke-free environment</td>
<td>A global cardiovascular risk reduction strategy</td>
<td>n/a</td>
</tr>
</tbody>
</table>
Interprofessional team care
♦ Involvement of an interprofessional team improves adherence

Lifestyle changes are important to make
♦ Frequent brief interventions double the rate of lifestyle changes
♦ All hypertensives require lifestyle assessment and ongoing support to initiate and maintain lifestyle changes

50% of hypertensives < 45 years old are not treated with antihypertensives even if they have multiple cardiovascular risks
♦ Start pharmacotherapy for hypertensives with multiple cardiovascular risks factors immediately, in addition to lifestyle changes
♦ In particular, reduce risk factors in smokers who cannot quit

Combination therapy of ACE inhibitor with ARB
♦ Reassess all patients on this combination
♦ Consider other combinations
♦ Should only be considered in selected and closely monitored patients with advanced heart failure, or severe proteinuric nephropathy

Hypertension Internet Resources

The web page below shows the initial assessment screen of The Heart and Stroke Foundation’s online consumer education tool – My Heart&Stroke Blood Pressure Action Plan™. It will help educate your patients about the importance of managing their blood pressure and provide ways to help them do so.

Canadian Hypertension Education Program (CHEP)
www.hypertension.ca
• Complete hypertension recommendations and slide decks
• Patient and HCP Resources
• Instructions for purchasing and using home blood pressure measurement devices

Heart and Stroke Foundation, My Heart&Stroke Blood Pressure Action Plan™
www.heartandstroke.ca/BP
• My Heart&Stroke Blood Pressure Action Plan™
www.heartandstroke.ca
• General lifestyle change information

Canadian Diabetes Association
www.diabetes.ca/for-professionals/resources/2008-cpg/
• 2008 clinical practice guidelines

Canadian Stroke Network
www.sodium101.ca
• Patient and HCP resource on dietary sodium

Public Health Agency of Canada
www.PHAC-ASPC.gc.ca
• Resources on hypertension and chronic disease prevention and management

Hypertension Update
www.htnupdate.ca
• Sign up now for regular Hypertension Canada resource updates

myBP
www.myBPsite.ca
• Have your patients sign up to access the latest hypertension resources
## Considerations in the Individualization of Antihypertensive Therapy*

### Hypertension Without Other Compelling Indications

<table>
<thead>
<tr>
<th>Condition</th>
<th>Initial Therapy</th>
<th>Second-line Therapy</th>
<th>Notes and/or Cautions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diastolic +/- Systolic Hypertension</td>
<td>Thiazide diuretics, beta-blockers, ACE inhibitors, ARBs, or long-acting calcium channel blockers (consider ASA and statins in selected patients). Consider initiating therapy with a combination of first-line drugs if the blood pressure is ≥20 mmHg systolic or ≥10 mmHg diastolic above target.</td>
<td>Combinations of first-line drugs</td>
<td>Beta-blockers are not recommended as initial therapy in those older than 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 in blacks. ACE inhibitors, ARBs and direct renin inhibitors are potential teratogens, and caution is required if prescribing to women of child-bearing potential. Combination of an ACE inhibitor with anARB is not recommended.</td>
</tr>
<tr>
<td>Isolated systolic hypertension without other compelling indications</td>
<td>Thiazide diuretics, ARBs or long-acting dihydropyridine calcium channel blockers</td>
<td>Combinations of first-line drugs</td>
<td>Same as diastolic +/- systolic hypertension</td>
</tr>
</tbody>
</table>

### Diabetes Mellitus

<table>
<thead>
<tr>
<th>Condition</th>
<th>Initial Therapy</th>
<th>Second-line Therapy</th>
<th>Notes and/or Cautions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diabetes mellitus with albuminuria*, cardiovascular disease, renal disease or additional cardiovascular risk factors</td>
<td>ACE inhibitors or ARBs</td>
<td>Addition of dihydropyridine CCB is preferred over thiazide</td>
<td>A loop diuretic could be considered in hypertensive CKD patients with extracellular fluid volume overload.</td>
</tr>
<tr>
<td>Diabetes mellitus not included in the above category</td>
<td>ACE inhibitors, ARBs, dihydropyridine CCBs or thiazide diuretics</td>
<td>Combination of first-line drugs or, if first-line agents are not tolerated, addition of cardioselective beta-blockers and/or long-acting nondihydropyridine CCBs</td>
<td>Normal albumin to creatinine ratio [ACR] &lt;2.0 mg/mmol in men and &lt;2.8 mg/mmol in women. Combination of an ACE inhibitor with an ARB is specifically not recommended.</td>
</tr>
</tbody>
</table>

### Cardiovascular Disease

<table>
<thead>
<tr>
<th>Condition</th>
<th>Initial Therapy</th>
<th>Second-line Therapy</th>
<th>Notes and/or Cautions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coronary artery disease**</td>
<td>ACE inhibitors or ARBs (except in low-risk patients); beta blockers for patients with stable angina</td>
<td>Long-acting CCBs. When combination therapy is being used for high risk patients, an ACE inhibitor/dihydropyridine CCB is preferred</td>
<td>Avoid short-acting nifedipine. Combination of an ACE inhibitor with an ARB is specifically not recommended.</td>
</tr>
<tr>
<td>Prior myocardial infarction</td>
<td>Beta-blockers, ACE inhibitors (ARBs if ACE inhibitor intolerant)</td>
<td>Long-acting CCBs</td>
<td>Combination of an ACE inhibitor with an ARB is specifically not recommended.</td>
</tr>
<tr>
<td>Heart failure</td>
<td>ACE inhibitors (ARBs if ACE inhibitor intolerant) and beta-blockers. Spironolactone in patients with NYHA class III or IV symptoms</td>
<td>ARB in addition to ACE inhibitor. Hydralazine/isosorbide dinitrate combination. Thiazide or loop diuretics are recommended as additive therapy</td>
<td>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 an ACE inhibitor with an ARB.</td>
</tr>
<tr>
<td>Left ventricular hypertrophy</td>
<td>Does not affect initial treatment recommendations</td>
<td>Combination of additional agents</td>
<td>Hydralazine and minoxidil can increase left ventricular hypertrophy.</td>
</tr>
<tr>
<td>Past stroke or TIA</td>
<td>ACE inhibitor/diuretic combinations</td>
<td>Combinations of additional agents</td>
<td>This does not apply to acute stroke. Blood pressure reduction reduces recurrent cerebrovascular events in stable patients. Combination of an ACE inhibitor with an ARB is specifically not recommended.</td>
</tr>
</tbody>
</table>

### Non-diabetic Chronic Kidney Disease with Proteinuria*

<table>
<thead>
<tr>
<th>Condition</th>
<th>Initial Therapy</th>
<th>Second-line Therapy</th>
<th>Notes and/or Cautions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-diabetic chronic kidney disease with proteinuria†</td>
<td>ACE inhibitors (or ARBs if ACEI-intolerant) if there is proteinuria. Diuretics as additive therapy</td>
<td>Combinations of additional agents</td>
<td>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.</td>
</tr>
<tr>
<td>Renovascular disease</td>
<td>Does not affect initial treatment recommendations</td>
<td>Combinations of additional agents</td>
<td>Avoid ACE inhibitors or ARB if bilateral renal artery stenosis or unilateral disease with solitary kidney.</td>
</tr>
</tbody>
</table>
Interventions That Can Help Improve Medication Adherence

**Adherence can be improved by a multi-pronged approach:**

1) **At every visit, assist your patient to adhere using a multi-pronged approach**
   a) Tailor and simplify pill-taking to fit your patient’s daily habits
   b) Fixed dose combination
   c) Blister packaging (of several medications to be taken together)

2) **Assist your patient in getting more involved in his/her treatment**
   a) Encourage greater responsibility/autonomy in monitoring his/her blood pressure and reporting the results, so you may adjust his/her prescriptions as needed

3) **Improve your management in the office and beyond**
   a) Educate your patient and his/her family about hypertension and its treatment
   b) Inform your patient of their global risk to improve the effectiveness of risk factor modification using vascular or cardiovascular age
   c) Adherence to an antihypertensive prescription can be improved by an interprofessional team approach, including working collaboratively with a pharmacist
**The Role of Sodium**

13% of CV events in Canada are attributed to excess dietary sodium

**Beyond the Salt Shaker: Key Messages for Healthcare Professionals**

1. Dietary sodium is an important contributor to high blood pressure.
2. Canadian sodium intake is well above recommended levels.
3. Lowering sodium intake is good for public health.
4. Processed foods are our main source of dietary sodium.
5. Healthcare professionals can play a key role.

**Guidelines for sodium intake**

<table>
<thead>
<tr>
<th>Age</th>
<th>Recommended Intake</th>
</tr>
</thead>
<tbody>
<tr>
<td>19-50</td>
<td>1500</td>
</tr>
<tr>
<td>51-70</td>
<td>1300</td>
</tr>
<tr>
<td>71 and over</td>
<td>1200</td>
</tr>
</tbody>
</table>

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Your patients can also sign up at www.myBPsite.ca for 2011 annual membership in myBP where they will receive email notices of updated and new educational resources, a regular newsletter and lectures.

Hypertension recommendations designed for public education have been developed in 2011. Bulk orders of 25 or more copies can be obtained by contacting admin@hypertension.ca. Hypertension recommendations for patients with diabetes, developed in 2009, are also available. These summaries are available electronically at www.hypertension.ca/bpc.

For an internet-based, interactive tool to optimize self-management and track home blood pressure measurement and lifestyle change, visit www.heartandstroke.ca/bp.
Key Messages

1. Assess blood pressure at all appropriate visits.

2. Promote a healthy lifestyle to lower blood pressure and reduce the risk of cardiovascular disease at each visit with interventions to reduce high dietary sodium, for smoking cessation, to reduce abdominal obesity, to promote a healthy weight, to increase physical activity and to manage dyslipidemia and dysglycemia.

3. Treat blood pressure to less than 140/90 mmHg in most people and to less than 130/80 mmHg in people with diabetes or chronic kidney disease using a combination of drugs and lifestyle modifications.

4. Advocate for healthy public policies to prevent hypertension and advance the health of patients and populations.

5. Keep up to date with resources for the prevention and control of hypertension by registering at www.htnupdate.ca and downloading and ordering tools at www.hypertension.ca/tools/.

For the complete version of the 2011 CHEP Recommendations please refer to our website at www.hypertension.ca

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