2011 Canadian Hypertension Education Program Recommendations: 

The Short Clinical Summary - An Annual Update 

On behalf of the Canadian Hypertension Education Program 

Acknowledgement: This manuscript was written by Dr Norm Campbell with the CHEP Executive and contributions by Dr. Tavis Campbell, Dr. Steven Grover, Dr. Michael Hill and Dr. Raj Padwal
Increased blood pressure remains one of the major health and economic issues facing the world (1;2). In 2010, a new Statistics Canada survey reported that Canada had the world's highest reported national rates of people being aware of a hypertension diagnosis, being treated and being controlled (3). In fact, the Canadian rate of treatment and control increased 5 fold since the prior national survey in 1985-1997(4). Further additional surveillance data has linked reductions in the rates of premature total, cardiovascular, stroke, heart failure and acute myocardial infarction mortality rates to increases in antihypertensive treatment in Canada (5;6). The Canadian success, based almost entirely on the clinical care provided by primary care health care professionals is emphasized by the Canadian treatment and control rate of 66% while most developed countries have control rates of less than 30%(7). While the Canadian model for blood pressure awareness treatment and control is an example to other countries of what is possible, there is still a need for improvement and the demonstration that the gains made so far are sustainable.

2011 marks the 12th consecutive year that the Canadian Hypertension Education Program (CHEP) has updated recommendations for the management of hypertension. CHEP was developed to assist primary care providers and people with hypertension better manage and prevent hypertension (8). 2011 marks another milestone in CHEPs history as now CHEP is part of a unified national hypertension organization, Hypertension Canada. The Hypertension Canada leadership is aggressively moving forward to achieve a common vision - a vision that will bring about positive benefits for the millions of people in Canada who, on a daily basis,
deal with the dangers and harmful effects of hypertension. Hypertension Canada is a newly integrated volunteer-based, not-for-profit organization joining the resources and expertise of three already strong organizations (Blood Pressure Canada, Canadian Hypertension Society and Canadian Hypertension Education Program) representing over 50 years of expertise in the field of hypertension. Through its members Hypertension Canada can provide ONE authoritative voice on hypertension with more synergistic interactions across all pillars of education, scholarship and research. Its mission is: “Advancing health by the prevention and control of high blood pressure through research, advocacy, education and knowledge development and translation.” For more information contact Judi Farrell, Executive Director at judi.farrell@hypertension.ca or visit the Hypertension Canada website at www.hypertension.ca

A major new thrust of Hypertension Canada is to develop a Public Policy Committee to work with government and non-government organizations to promote healthy public policies, health services policies and community capacity building to prevent and control 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. Hence, the 2011 CHEP theme is a call to action to all Canadians, including clinicians and scientists to advocate for policies to keep Canadians healthier though improved prevention and control of hypertension (complementary to the recently adopted Declaration by the Ministers of Health and of Health Promotion/Healthy
Living making the promotion of health and the prevention of disease a priority for Canada 

The 2010 CHEP theme to increase accessibility to hypertension resources and to increase the impact of CHEP will be sustained in 2011 as well. Health care professionals can enroll at www.htnupdate.ca to get automated email notices when new or updated hypertension resources are available for them or their patients. Current resources can also be downloaded at www.hypertension.ca. A case-based interactive lecture series on clinically important hypertension topics has just been launched in 2010. This program is training primary care physicians to become Peer Educators so they can teach this material to their colleagues. It will also leverage the internet to facilitate interaction with top national hypertension experts and provide timely feedback. The series of CME topics was drawn from national needs assessments combined with what’s new in the annual CHEP recommendations. A series of podcasted lectures are coming which can be watched or listened to. Table 1 and 2 indicate current hypertension resources that are available for health care professionals and people with hypertension.

Hypertension Canada is also developing a hypertension association for Canadians with high blood pressure. Encourage people with hypertension to sign up for free membership at www.myBPsite.ca. Members will receive electronically updated and new educational resources, a regular newsletter, and the future plans include discount coupons to encourage
a healthy lifestyle, lectures and personalized health care professional advice. Members will be given opportunities to provide advice on the need for new hypertension resources and revise current blood pressure resources.

Areas of Clinical Hypertension Management in Canada that are emphasized by CHEP in 2011

Hypertension in People with Diabetes

Most people with diabetes die of cardiovascular disease. Many of the specific complications in people with diabetes 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 (9;10). In 2010, new clinical trial data became available to address the systolic blood pressure targets and while some have called for a less intensive systolic blood pressure target based on this data, CHEP based on its critical analysis and consensus discussion, recommends maintaining the blood pressure target of less than 130/80mmHg.

Among studies which aimed at assessing the effect of intensive blood pressure control in patients with diabetes, the Action to Control Cardiovascular Risk in Diabetes Blood Pressure Intervention Trial (ACCORD- BP) was highly anticipated to give information about the systolic blood pressure target. The ACCORD trial was designed to examine the effect of high vs. usual
intensity of glucose lowering in all 10,251 participants, to determine whether treating systolic blood pressure to less than 120 mmHg was superior to less than 140 mmHg in 4733 participants and also addressed the usefulness of fibrate based lipid lowering therapy (in addition to statin based lipid lowering therapy) in the rest (11). While the main outcome of the ACCORD-BP study was that more intensive BP reduction was not superior to less intensive reduction, there were several issues relating to the ACCORD trial data that precluded CHEP accurately interpreting the results at this time. Because study patients did better than predicted based on the event rates of older studies, there were 50% fewer cardiovascular events in the ACCORD trial than expected, limiting the trial’s ability to assess the clinical questions it was designed to address. Perhaps more importantly the blood glucose lowering and blood pressure lowering treatments used in the ACCORD trial appeared to interact in a fashion that impacted the trial primary outcome. In this setting, the different treatments are recommended to be considered independently and not combined. Unfortunately only the details of the combined results were published with little information presented on the treatments considered separately. There was a difference in the primary blood pressure outcome in the two different glycaemic target arms. In the usual glycaemic control arm (now the standard of care), there appeared to be a statistically significant 24% relative decrease in the ACCORD trial’s primary composite outcome in the intensive BP treatment arm compared to the standard treatment arm. In the intensive glucose lowering arm of the study, there appeared to be no benefit to intensive BP control. Finally, the ACCORD trial did not directly include a comparison arm of less than 130 mm Hg, which is the threshold currently recommended and so it does not directly inform
whether or not this threshold should be maintained. Given the lack of analysis provided and the lack of data to support a change in the target blood pressure for people with diabetes CHEP has left the target blood pressure at less than 130/80 mmHg for 2011. CHEP will revisit the target blood pressure once more detailed analysis of the ACCORD trial becomes available.

**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 (12;13). 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. Prior to 2010 CHEP has not provided recommendations for managing hypertension in acute stroke however the following guidance is now recommended by CHEP and the Canadians Stroke Network (14).

People with ischemic stroke eligible for thrombolytic therapy: Very high BP (>185/110mmHg) should be treated concurrently in patients receiving thrombolytic therapy for acute ischemic stroke in order to reduce the risk of secondary intracranial hemorrhage.

People with ischemic stroke not eligible for thrombolytic therapy: Treatment of hypertension in the setting of acute ischemic stroke should not be routinely undertaken. Extreme blood pressure elevation (e.g. systolic > 220 or diastolic > 120mmHg) may be treated to reduce the blood pressure by ~15 percent, and not more than 25%, over the first 24h with gradual
reduction thereafter. Avoid excessive lowering of blood pressure as this may exacerbate existing ischemia or may induce ischemia, particularly in the setting of intracranial arterial occlusion or extracranial carotid or vertebral artery occlusion.

CHEP has not specifically made recommendations for the management of blood pressure in people with intracerebral hemorrhage however a pilot study presented preliminary data that blood pressure lowering was relatively safe and reduced the volume of the hemorrhage (15).

Ongoing clinical trials will provide more evidence in the management of blood pressure during acute stroke in the next few years (15). Importantly controlling blood pressure so it is consistently below 140/90 mmHg more than 72 hours after the acute event is one of the most important interventions to preventing a recurrent stroke or Transient Ischemic Attack (TIA) (16).

Cancer and Angiotensin Receptor Blockers.

The 2011 guidelines continue to recommend the use of angiotensin receptor blockers (ARB) in appropriate clinical situations. Many antihypertensive drugs have been associated with cancer only to have follow-up studies provide evidence that the drugs do not cause cancer (17). A post-hoc meta-analysis of 8 RCTs examining the association between ARBs and cancer was reviewed (18). This analysis provides associative but not causal evidence for an increased risk of malignancy with ARB therapy. The task force noted that the US Food and
Drug Administration has not concluded that ARBs increase the risk of cancer and believes the benefits of ARBs continue to outweigh their potential risks pending the results of their safety review. Given the potential that increased cardiovascular events may result from the sudden discontinuation of antihypertensive therapy, the task force viewed the stance of the FDA as prudent and plans to revisit this issue as forthcoming data become available.

An ongoing safety review of this issue is taking place by the FDA (http://www.fda.gov/Drugs/DrugSafety/PostmarketDrugSafetyInformationforPatientsandProviders/ucm218845.htm#Additional_Information_for_Healthcare_Professionals). After critically reviewing the Sihapi meta-analysis, CHEP agreed with the FDA position that pending completion of their review, the indications for use of ARBs should be maintained unchanged.

**Key issues in the Management of the patient with hypertension:**

**Assess blood pressure at all appropriate visits and encourage home measurement of blood pressure**

Systolic blood pressure increases linearly with age. More than half of Canadians over age 60 have hypertension and it is estimated that 9 in 10 Canadians will develop hypertension within an average lifespan (19). All adults require ongoing assessment of blood pressure and Canadians with high normal blood pressure require annual blood pressure assessment as over ½ will develop hypertension within 4 years (20).
Home measurement of blood pressure can increase patient self efficacy and is recommended for people with hypertension. Home blood pressure readings are more closely associated with cardiovascular outcomes than readings taken in a health care professional’s office, 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 (21). Patient instructions for purchasing and using home blood pressure measurement can be found in Table 3 and at the bottom of www.hypertension.ca and at www.heartandstroke.ca/BP a comprehensive instructional video on home measurement can be downloaded from www.hypertension.ca/video. Patients can find resources to help them measure blood pressure at www.MyBPsite.ca.

Assess and manage overall cardiovascular risk in all people with hypertension including: smoking, unhealthy eating, physical inactivity, abdominal obesity, dyslipidemia, and dysglycemia (e.g. glucose intolerance, diabetes). CHEP recommends consideration of the use of a risk assessment that incorporates cardiovascular or vascular age as tool to aid patient adherence and understanding of an individual’s cardiovascular risk. (22-24)(www.myhealthcheckup.com and www.monbilansante.com). The vast majority of hypertensive Canadians have other cardiovascular risks (25). Comprehensive screening and management of other risk factors in addition to hypertension can double the reduction in
cardiovascular risk, lower the blood pressure target (Table 4) and change the types of antihypertensive medications recommended (Table 5). Many people with multiple cardiovascular risks or cardiovascular disease have uncontrolled blood pressures and those who smoke are less, rather than more, likely to be treated (26-28). Pharmacotherapy has the greatest potential absolute benefit and cost effectiveness in these higher risk patients. Health care professionals and the public can have access the SCORE Canada .ca risk assessment resource at www.scorecanada.ca.

**A healthy lifestyle improves cardiovascular risk and reduces blood pressure in the prevention and treatment of hypertension.** Healthy eating, regular physical activity, low risk alcohol consumption, reductions in dietary sodium and in some, stress reduction (Table 6) can prevent or treat hypertension as well as other cardiovascular risks. Even though Canadians report trying to change their lifestyle, this may not be possible due to, for example, high sodium content of processed foods. Importantly brief health care professional advice assists patients to make lifestyle changes (29). The Heart and Stroke Foundation’s eHealth tool, My Heart&Stroke Blood Pressure Action Plan (www.heartandstroke.ca/BP) is designed to assess hypertensive patients’ lifestyles, provide personalized e-mail support and facilitate self-management through its interactive portal that allows people to track their BP and progress and achievements in their selected lifestyle area of focus. Several patient handouts on hypertension can also be obtained from www.hypertension.ca. Patients can also sign up for regular updates and information on hypertension at www.myBPsite.ca. This later website
is expected to evolve into a public hypertension association to represent the interests of people with hypertension providing an opportunity for people with hypertension to obtain resources, have a say in what resources are developed for them and to impact on policies that impact their health. The CHEP theme in 2011 highlights the need for people with hypertension, clinicians and scientists to advocate for healthy policy changes to facilitate Canadians choosing healthier lifestyles.

**Treat to target (<140/90 mmHg; <130/80 mmHg in people with diabetes or chronic kidney disease).** CHEP blood pressure targets reflect current best evidence to optimally reduce cardiovascular disease (Table 4). Failure to achieve blood pressure targets result in higher cardiovascular risk while lowering blood pressure substantially below a target is of undetermined benefit/harm. People with known cardiovascular disease, diabetes or chronic kidney disease are at high cardiovascular risk and have the greatest reduction in cardiovascular events by achieving blood pressure targets (26-28).

**If blood pressure is above target reassess the patient at least every 2 months.** Follow-up at short intervals improves patient of adherence and is required to increase the intensity of treatment.

**Help patients adhere to therapy.** Adherence to lifestyle change and pharmacotherapy should be assessed at each visit. Health care professional interventions can reduce non-
adherence and improve adherence in those who are having problems (Table 7). Integrating pharmacists into the care of people with hypertension improves blood pressure control (30;31).

**Comments from the CHEP executive**

While Canada has become a world leader in the effort to control hypertension many Canadians remain at increased risk from elevated blood pressure. This is especially true of those with increased blood pressure within the normal range where most cardiovascular events occur. Population interventions to lower blood pressure such as reducing dietary sodium in all Canadians could prevent hypertension in many, improve blood pressure control and reduce the cardiovascular risk of Canadians in both the normal and hypertensive range(32-34). In 2010, the Federal and Provincial Governments of Canada announced they would collaborate to oversee a reduction in sodium additives to food, an education program for Canadians on how to reduce dietary sodium and enhance research to aid the effort to reduce dietary sodium. Additional collaborative government actions to improve diet and physical activity could substantially add to the sodium reduction program and further prevent hypertension and cardiovascular disease as well as a host of other chronic diseases including cancer. Further more systematic approaches to the care of people with hypertension could result in more cost effective, earlier and complete identification of people with hypertension.
and result in further improvements in blood pressure control (35). This includes greater emphasis on health promotion and disease prevention in the primary health care setting. Part of the effort to control hypertension (and other cardiovascular risks) is ensuring communities have the capacity to identify and manage hypertension as cost effectively as possible (36). Individual health care professionals and scientists and the organizations that represent them could have a much more important role in interacting with governments to ensure policies are developed and implemented to prevent and control hypertension (and other health risks). Extensive reports have summarized the evidence for policy changes and outlined policies that would make Canadians much healthier(1;37-39). CHEP calls on Canadians, and specifically health care professionals and scientists to work with governments to ensure the healthy policies to lower blood pressure improve health services delivery and community capacity are carefully considered and appropriately implemented to the benefit of Canadians. In 2011, Hypertension Canada will activate a Public Policy Committee to facilitate this process.

Each year CHEP reviews the new evidence and integrates it into the previous evidence base to develop new recommendations where appropriate. CHEP members also consider the deliberations of international experts and other recommendations processes throughout the year. In 2010, the blood pressure targets that have been recommended around the world have been called into question. Early clinical trials were based on diastolic blood pressure and there is strong evidence supporting diastolic blood pressure targets for both people with uncomplicated hypertension (e.g. without other compelling indications) as well as for people
with diabetes. For systolic blood pressure, the quality of evidence is less strong in part because ethically, recent trials were required to have active treatment comparisons because systolic blood pressure is strongly correlated with diastolic blood pressure. In many of the more recent trials, the entry criteria included a systolic blood pressure of 140 mmHg or over and in these trials small reductions in blood pressure between different treatment regimes were associated with reductions in cardiovascular outcomes. While more carefully designed clinical trials would define the current systolic targets more precisely, there is little evidence on which to suggest alternative targets at this time.

CHEP continues to recognize the difficulties health care professionals and hypertensive Canadians have in staying informed of the current recommendations for preventing and controlling high blood pressure. At www.htnupdate.ca, you can enroll to be notified of all new hypertension resources produced by CHEP for you or your patients. Your patients can also sign up at MyBPsite.ca to receive updated information developed to assist them manage their blood pressure.

Hypertension Canada would like to thank the over 150 health care professional volunteers, who are working in CHEP to prevent and control hypertension. The collaborative effort has been associated with marked improvements in the management and outcomes of hypertensive Canadians.
Acknowledgement: The tables are used with permission of Hypertension Canada
Table 1 Health Care Professional Resources*

Documents

1) CHEP primary care booklet. Brief outline of hypertension management recommendations in a pocket booklet form

2) Key messages. The major 5 actions required by health care professionals to prevent and control cardiovascular disease in people with hypertension.

3) One page summary. A one page summary of the CHEP theme, key messages and new recommendations.

4) Short clinical summary. A brief narrative clinical summary of the current CHEP theme and recommendations with an emphasis on what is new and what is important. Tables summarize key aspects of hypertension care.

5) Short scientific summary. A brief narrative summary of what is new and what is important with an emphasis on the scientific basis for the recommendations. Tables summarize key aspects of hypertension care.

6) CHEP specialist booklet. Contains the short scientific summary and the exact CHEP recommendations in a pocket booklet format

7) Full scientific manuscripts. Detailed manuscripts that indicate the exact CHEP scientific recommendations for the management of hypertension with their scientific rationale.
Power Point Slide sets

1) Public education slide set: A slide set that is intended to be used to develop a general talk on hypertension to a public and/or patient audience.

2) Background slide set. A slide set that contains information on the health risks of hypertension and key therapeutic interventions.

3) Methodology Slide set. A slide set that outlines the methods CHEP uses to develop it recommendations as well as the key messages and theme for 2011.

4) Diagnostic Slide set. A slide set that outlines the diagnostic recommendations of CHEP as well as the key messages and theme for 2011.

5) Treatment Slide Set. A slide set that outlines the treatment recommendations of CHEP as well as the key messages and theme for 2011.

6) Blood Pressure Measurement. A slide set that outlines the measurement recommendations for blood pressure and includes advice on office, home and ambulatory blood pressure.

7) Outcomes Slide set. A slide set that outlines the various surveillance methods used by CHEP as well as key outcomes associated with CHEP. Ongoing hypertension management gaps are featured.

8) Hypertension resources. A new slide set that outlines what Canadian hypertension resources are available

9) What new slide set: A slide set that focuses on what is new for this year and what is old but still important.
Website resources

1) www.hypertension.ca : to download current resources for health care professional and patients
2) www.htnupdate.ca : to sign up to be regularly updated on new and updated resources for health care professional and patients and educational opportunities for health care professionals
3) www.lowersodium.ca : for educational resources for health care professionals and patients on dietary sodium

Dietary Sodium Resources

1) A short scientific summary of the importance of reducing dietary sodium with advice on how to reduce dietary sodium
2) A scientific summary of the evidence for lowering dietary sodium
3) Key messages on the importance of lowering dietary sodium with brief intervention advice

Dietary Sodium Power Point Slide Sets

1) Scientific and clinical slide set: A slide set intended to be used to develop a talk for a clinical or scientific audience
2) Public sodium Slide set: A slide set that is intended to be used to develop a talk on dietary sodium to a public and patient audience on hypertension

3) Sodium Quiz

* Health care professional resources can be downloaded from www.hypertension.ca and www.lowersodium.ca and people who sign up at www.htnupdate.ca will be automatically notified when resources are updated or newly developed.
Table 2: Resources for Canadians who have hypertension

Documents, power point slides and DVDs

1) **Brief public hypertension recommendations.** A 3 panel one page brochure that summarizes hypertension and its management to people who have hypertension or are at risk. The summary is based on the 2011 CHEP health care professional management recommendations.

2) **Public hypertension recommendations.** A 4 page pamphlet of hypertension and its management to people who have hypertension or are at risk. The summary is based on the 2011 CHEP health care professional management recommendations. The 2007 recommendations are available in 4 Indo Asian languages and cultural translations.

3) **Hypertension in Diabetes.** A 4 page pamphlet of hypertension and its management for people who have hypertension and diabetes. The summary is based on the CHEP health care professional management recommendations.

4) **How to Measure your Blood Pressure at Home.** A 1 page summary of how to purchase and use a home measurement device.

5) **Home Measurement of Blood Pressure.** A more detailed 4 page summary of how to purchase and use a home measurement device.

6) **Measuring blood pressure the right way.** A poster and small card that visually outlines the key steps to measuring blood pressure properly at home.
7) **Home measurement DVD.** A DVD that has a short and longer summary of how to measure your blood pressure at home as well as how to purchase and use a home blood pressure measuring devices.

8) **Public Education DVD (‘Hypertension: the Silent Killer’).** A short and longer summary of hypertension on DVD for the public or those with or at risk of having hypertension.

9) **Brief Action Tool.** A set of 3 tools to be used by a health care professional educator to engage a patient more fully in his/her care. Action tool 1 takes about 4 minutes to complete. It defines BP, why a patient needs to be concerned if s/he has High BP, and the risks of hypertension. Action Tool 2 takes 10 minutes and basically motivates a patient to think about changing his/her lifestyle. Action Tool 3 takes 7 minutes to complete. It talks about home measurement & recording of BP, as well as information on BP medication.

10) **Public Education Hypertension Slide set.** A slide set that is intended to be used by a knowledgeable health care professional in developing a presentation on hypertension to the public or people with hypertension.

**Dietary Sodium**

1) **Slides set for Public Education.** A slide set that is intended to be used by a knowledgeable health care professional in developing a presentation on dietary sodium to the public or people with hypertension.
2) **Get the facts on sodium Brochure.** A one page summary of the importance of reducing dietary sodium and the key messages to reduce dietary sodium.

3) **A Short Summary about dietary sodium for public awareness.** A very short summary of why reducing dietary sodium is important and how to reduce dietary summary.

4) **Healthy Eating for your Blood Pressure:** A more detailed summary of why it is important to reduce dietary sodium and how to reduce dietary sodium for the more interested consumer.

5) **Quiz:** A short series of questions and answers for people to use to test their sodium knowledge. It is in power point format for use in talks.

**Websites**

1) [www.myBPsite.ca](http://www.myBPsite.ca) : To join a hypertension association and be regularly updated on hypertension resources and material that is available.

2) [www.hypertension.ca](http://www.hypertension.ca) : To download patient related resources

3) [http://hypertension.ca](http://hypertension.ca) : To examine the different home blood pressure measurement devices that have passed international accuracy standards, are available in Canada and been approved by Hypertension Canada

4) [www.lowersodium.ca](http://www.lowersodium.ca) : Patient, public and health care professional information on dietary sodium.

5) [www.sodium101.ca](http://www.sodium101.ca) : Public information on dietary sodium.
6)  www.heartandstroke.ca/bp  : For an individualized action plan for lifestyle change and monitoring of blood pressure.

7)  www.nhlbi.nih.gov/hbp/prevent/h_eating/h_eating.htm  : For detailed information on eating the DASH diet.
Table 3: 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.
Table 4: Target Values for Blood Pressure

<table>
<thead>
<tr>
<th>Setting</th>
<th>Target (SBP/DBP mmHg)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Home:</strong></td>
<td></td>
</tr>
<tr>
<td>Home blood pressure *</td>
<td>&lt;135/85</td>
</tr>
<tr>
<td><strong>Office:</strong></td>
<td></td>
</tr>
<tr>
<td>Diastolic ± systolic hypertension</td>
<td>&lt;140/90</td>
</tr>
<tr>
<td>Isolated systolic hypertension</td>
<td>&lt;140</td>
</tr>
<tr>
<td>Diabetes</td>
<td>&lt;130/80</td>
</tr>
<tr>
<td>Chronic kidney disease</td>
<td>&lt;130/80</td>
</tr>
</tbody>
</table>

* The target value readings taken by home measurement in people with diabetes or chronic kidney disease have not been established.
Table 5: Considerations in the Individualization of Antihypertensive Therapy

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

<table>
<thead>
<tr>
<th>Hypertension without other compelling indications (target BP &lt; 140/90 mmHg)</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 an ARB is not recommended.</td>
</tr>
</tbody>
</table>

| 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 |

Diabetes mellitus (target blood pressure < 130/80 mmHg)
<table>
<thead>
<tr>
<th>Condition</th>
<th>Treatment Recommendations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diabetes mellitus not included in the above category</td>
<td>ACE inhibitors, ARBs, dihydropyridine CCBs or thiazide diuretics</td>
</tr>
<tr>
<td>Cardiovascular disease (target blood pressure &lt;140/90 mmHg)</td>
<td>ACE inhibitors or ARBs (except in low-risk patients); beta blockers for patients with stable angina</td>
</tr>
<tr>
<td>Coronary artery disease</td>
<td>Beta-blockers, ACE inhibitors (ARBs if ACE inhibitor intolerant)</td>
</tr>
<tr>
<td>Prior myocardial infarction</td>
<td>ACE inhibitors (ARBs if ACE inhibitor-intolerant) and beta-blockers. Spironolactone in patients with NYHA class III or IV symptoms.</td>
</tr>
<tr>
<td>Heart failure</td>
<td>Does not affect initial treatment recommendations</td>
</tr>
<tr>
<td>Left ventricular hypertrophy</td>
<td>ACE inhibitor/diuretic combinations</td>
</tr>
</tbody>
</table>
**Nondiabetic chronic kidney disease (target blood pressure <130/80 mmHg)**

<table>
<thead>
<tr>
<th>Condition</th>
<th>Treatment Recommendation</th>
</tr>
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<tbody>
<tr>
<td>Nondiabetic chronic kidney disease with proteinuria†</td>
<td>ACE inhibitors (ARBs if ACE inhibitor-intolerant) if there is proteinuria; Diuretics as additive therapy</td>
</tr>
<tr>
<td></td>
<td>Combinations of additional agents</td>
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<td></td>
<td>Avoid ACE inhibitors or ARBs 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 are specifically not recommended in patients with chronic kidney disease without proteinuria.</td>
</tr>
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</table>

| 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 |

<table>
<thead>
<tr>
<th>Other conditions (target blood pressure &lt;140/90 mmHg)</th>
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<tbody>
<tr>
<td>Peripheral arterial disease</td>
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<td>Dyslipidemia</td>
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<td>Overall vascular protection</td>
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Table 6: Lifestyle therapy to reduce the possibility of becoming hypertensive, 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 (≤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/m²)
5. A healthy waist circumference

   Europid < 102 cm for men
   < 88 cm for women

   South Asian, Japanese, < 90 cm for men

   Chinese < 80 cm for women

6. Reduction in sodium intake to 1500 mg /day is recommended for adults if under age 50;
   1300 mg if aged 51-70; 1200 mg if age >70*

7. A smoke free environment

   *lower levels of intake are recommended by the Canadian government for children
Table 7: Strategies to Improve Patient Adherence*

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
Educating patients and patients' families about their disease/treatment regimens

3) Improve your management in the office and beyond

Assessing adherence to pharmacological and non-pharmacological therapy at every visit

Reassess patients at least every 2 months for those patients with a blood pressure above target

Encouraging adherence with therapy by out of office contact (either by phone or mail), particularly over the first three months of therapy

Coordinating with pharmacists and work-site healthcare givers to improve monitoring of adherence with pharmacological and lifestyle modification prescriptions

Utilizing electronic medication compliance aids
Adherence to an antihypertensive prescription can be improved by a multidisciplinary team approach.

Reference List


Ref Type: Generic


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