



2007 CHEP Guidelines: An Annual Update

On behalf of the Canadian Hypertension Education Program (CHEP)

The year 2007 marks the eighth consecutive year that the Canadian Hypertension Education Program (CHEP) has updated recommendations for the management of hypertension. This year we have focused on the need to assess BP in all Canadian adults and to regularly assess BP in those with high-normal values. In addition, the 2007 recommendations support the increasing evidence that hypertension can be prevented through public health interventions to reduce dietary sodium intake.

New key messages

The new key messages identified in the 2007 CHEP recommendations are:

- the annual assessment of BP and
- sodium reduction.

Annual BP assessment

Adults with high-normal BP require annual BP assessment. One in five adult Canadians have high-normal BP (*i.e.*, 130 to 139/85 to 89 mmHg). Of those who are overweight and have high-normal BP, 40% will develop hypertension within two years and 60% will develop hypertension within four years. Therefore, annual or more frequent assessment of BP and appropriate lifestyle interventions to prevent hypertension are recommended for those with high-normal BP.

Sodium reduction

Reducing sodium in the diet of Canadians is also important as excess dietary sodium is a significant cause of hypertension. Patients and the general public need to be educated to select foods that are low in sodium (to aim for a sodium intake of < 100 mmol q.d.) and the food sector needs to reduce the sodium content of food, either voluntarily or by regulation.

Additional recommendations

Important additional recommendations for the management of the patient with hypertension have also been incorporated into the 2007 guidelines.

Assess BP at all appropriate visits

All Canadian adults need to have their BP assessed at all appropriate clinical visits. BP increases with age such that 50% of Canadians > 65-years-of-age have hypertension. For those with normal BP at age 65, > 90% will develop hypertension within their lifespan.

To identify those with hypertension, all adults require ongoing assessment of BP throughout their lives.

Assessing overall CV risk

Optimum management of hypertension requires the assessment of one's overall cardiovascular



(CV) risk. Over 90% of Canadians with hypertension have other CV risks. Identifying and managing risk factors beyond hypertension can reduce the overall risk of CV disease by > 60%, alter the BP target (Table 1) as well as specific classes of recommended antihypertensive medications (Table 2).

Lifestyle modifications

Lifestyle modifications are effective in reducing BP and CV risk. Hypertension can be prevented, BP can be reduced and other CV risks are favourably impacted by:

- a healthy diet,
- regular physical activity,
- moderation in alcohol intake,
- reductions in dietary sodium and, in some,
- stress reduction (Table 3).

Simple and brief healthcare professional interventions markedly increase the probability of a patient adhering to lifestyle changes.

Treat to recommended targets

Treat patients to the recommended targets to achieve optimum CV risk reduction. Greater reduction in CV disease is achieved by lowering the BP to the stated targets (Table 1).

Combine therapies

Combining therapies (*i.e.*, both drug and lifestyle) are generally necessary to achieve target BPs. Most patients require more than one antihypertensive drug and lifestyle change to achieve recommended BP targets. When using two drugs to lower BP, the following combinations produce less than additive hypotensive effects:

- β -blocker,
- angiotensin-converting enzyme inhibitor, or
- angiotensin receptor blocker.

Monitor high BP patients regularly

Patients whose BP is above target should be monitored at least every two months.

To achieve BP control, follow-up at short intervals is required to both improve patient adherence and to increase the intensity of treatment.

Your focus: adherence

Focus on adherence. Non-adherence to therapy is one of the most important challenges to improving BP control. Adherence to therapy should be assessed at each visit. If necessary, specific interventions should be implemented as they can improve adherence to therapy (Table 4).

Table 1

Target values for BP*

Condition	Target (systolic BP/diastolic BP)
Diastolic with or without systolic hypertension	< 140/90 mmHg
Isolated systolic hypertension	< 140 mmHg
Diabetes	< 130/80 mmHg
Chronic kidney disease	< 130/80 mmHg

* It is recommended that normotensive adults with established cardiovascular disease be treated with an angiotensin-converting enzyme (ACE) inhibitor. Normotensive adults who have had a stroke or transient ischemic attack should be treated with an ACE inhibitor and a diuretic.

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Table 2

Considerations in the individualization of antihypertensive treatment

Hypertension without other compelling indications	Initial therapy	Second-line therapy	Notes and/or cautions
Diastolic with or without systolic hypertension	Thiazide diuretics, β -blockers, ACE inhibitors, ARBs, or long-acting CCBs (consider ASA and statins in selected patients)	Combinations of first-line drugs	β -blockers are not recommended as initial therapy in those > 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 African-Americans. ACE inhibitors and ARBs are teratogenic and marked caution is required if prescribing to women of child bearing potential
Isolated systolic hypertension without other compelling indications	Thiazide diuretics, ARBs or long-acting dihydropyridine CCBs	Combinations of first-line drugs	Same as diastolic with or without systolic hypertension
Diabetes mellitus	Initial therapy	Second-line therapy	Notes and/or cautions
Diabetes mellitus with nephropathy	ACE inhibitors or ARBs	Addition of thiazide diuretics, cardioselective β -blockers, long-acting CCBs or use an ARB/ACE inhibitor combination	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 β -blockers and/or long-acting non dihydropyridine CCBs	Albumin to creatinine ratio (ACR) < 2.0 mg/mmol in men and < 2.8 mg/mmol in women

ARB: Angiotensin II receptor blocker

CCB: Calcium channel blocker

ASA: Acetylsalicylic acid

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Table 2

Considerations in the individualization of antihypertensive treatment cont'd...

CV and cerebrovascular disease	Initial therapy	Second-line therapy	Notes and/or cautions
Angina	β-blockers and ACE inhibitors except in low-risk revascularized patients	Long-acting CCBs	Avoid short-acting nifedipine
Prior MI	β-blockers and ACE inhibitors (ARBs if patient is ACE inhibitor-intolerant)	Long-acting CCBs	
Heart failure	ACE inhibitors (ARBs if ACE inhibitor-intolerant), β-blockers and spironolactone	ARBs or hydralazine/isosorbide dinitrate (thiazide or loop diuretics, as additive therapy)	Avoid nondihydropyridine CCBs (diltiazem, verapamil). Monitor potassium and renal function if combining an ACE inhibitor and ARB.
Left ventricular hypertrophy	ACE inhibitors, ARBs, dihydropyridine CCBs, diuretics, (β-blockers for patients < 55-years-of-age)		Avoid hydralazine and minoxidil
Past cerebrovascular accident or TIA	ACE inhibitor/diuretic combinations		This does not apply to acute stroke. BP reduction reduces recurrent cerebrovascular events in patients with stable past cerebrovascular disease
Non-diabetic CKD	Initial therapy	Second-line therapy	Notes and/or cautions
Non-diabetic CKD with proteinuria	ACE inhibitors (ARBs if ACE inhibitor-intolerant) diuretics as additive therapy	Combinations of additional agents	Avoid ACE inhibitors or ARBs if bilateral renal artery stenosis or unilateral disease with solitary kidney. Patients placed on ACE inhibitors or ARBs should have their serum creatinine and potassium carefully monitored
Renovascular disease	Similar to diastolic with or without systolic hypertension without compelling indications for other medications		Avoid ACE inhibitors or ARBs if bilateral renal artery stenosis or unilateral disease with solitary kidney
Other conditions	Initial therapy	Second-line therapy	Notes and/or cautions
Peripheral arterial disease	Does not affect initial treatment recommendations	Does not affect initial treatment recommendations	Avoid β-blockers with severe disease

CV: Cardiovascular

TIA: Transient ischemic attack

CKD: Chronic kidney disease



Table 3

Lifestyle therapy to reduce the possibility of becoming hypertensive, to reduce BP and to reduce the risk of BP-related CV complications in hypertensive patients

1. **Healthy diet:** high in fresh fruits, 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 to 60 minutes of moderate intensity dynamic exercise 4 to 7 days per week
3. **Low-risk alcohol consumption:** ≤ 2 standard drinks q.d. and < 14 per week for men and < 9 per week for women
4. **Attaining and maintaining ideal body weight:** body mass index 18.5 kg/m^2 to 24.9 kg/m^2
5. **Waist circumference:** < 102 cm for men and < 88 cm for women
6. **Reduction in sodium intake:** < 100 mmol q.d.
7. **Smoke free environment**

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Table 4

Strategies to improve patient adherence

Adherence can be improved by a multi-pronged approach:

1. Adherence to pharmacological and nonpharmacological therapy should be assessed at every visit
2. Simplify medication regimens using once daily dosing of long-acting medications, combination tablets and utilizing medication compliance aids
3. Tailor pill-taking to fit patients' daily habits
4. Encourage greater patient responsibility by encouraging home BP monitoring
5. Coordinate with chronic disease management programs to improve monitoring of adherence with pharmacological and lifestyle modification prescriptions
6. Educate patients and patients' families about hypertension and its treatment

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