2020 HYPERTENSION HIGHLIGHTS

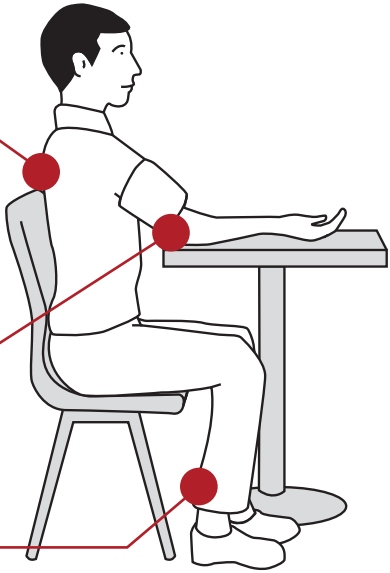
A Practical Guide informed by the Hypertension Canada Guidelines for the Diagnosis, Risk Assessment, Prevention, and Treatment of Hypertension

Hypertension CANADA

BLOOD PRESSURE MEASUREMENT TECHNIQUE

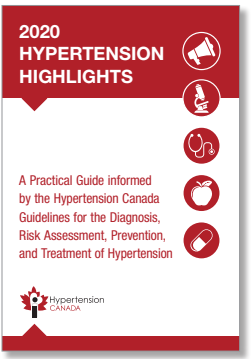
Accurate diagnosis begins with accurate measurement:

- ✓ Sitting position
- ✓ Back supported
- ✓ Arm bare and supported
- ✓ Use a cuff size appropriate for your arm
- ✓ Middle of the cuff at heart level
- ✓ Lower edge of cuff 3 cm above elbow crease
- ✓ Do not talk or move before or during the measurement
- ✓ Legs uncrossed
- ✓ Feet flat on the floor



Hypertension CANADA

HYPERTENSION 2020: HIGHLIGHTS



The Hypertension Canada Guidelines are the nation's clinical practice guidelines for the management of hypertension. Developed by an expert volunteer network, the Guidelines are evidence-based, rigorously reviewed, and updated regularly to keep Canada's health care professionals informed of best-practices in hypertension management.

This booklet highlights the most critical and widely relevant aspects of the Hypertension Canada Guidelines. Beginning with proper measurement techniques for diagnosis and advancing through treatment and follow up, this booklet serves as a practical guide for health care professionals.

The full Guidelines with supporting evidence, which also address complex specialty issues, can be accessed at guidelines.hypertension.ca.

I. MEASUREMENT

The use of standardized measurement techniques and validated equipment is recommended for all blood pressure (BP) methods.

- Automated office blood pressure (AOBP)
- Non-automated (manual) office blood pressure (Non-AOBP)

Preferred method for **in-office measurement**

- Home Blood Pressure Monitoring (HBPM)
- Ambulatory Blood Pressure Monitoring (ABPM)

Preferred out-of-office methods for **diagnosis**

Are you measuring correctly?

Accurate diagnosis begins with accurate measurement.

Evidence demonstrates that routine manual BP readings obtained in clinical practice are, on average, higher than when standardized measurement devices are used. Inaccuracies in BP measurement can have clinical consequences such as incorrect diagnosis, misclassification of cardiovascular risk, or improper dosage of antihypertensive medication.

Measurement using electronic upper arm devices is preferred over auscultation. If electronic devices are unavailable, be sure to implement the recommended standardized technique for non-AOBP measurement.

Is arm size an issue?

In patients with large arm circumference, when standard upper arm measurement methods cannot be used, validated wrist devices (utilized with arm and wrist supported at heart level) may be used for blood pressure estimation.

It is important to note that wrist devices are for estimation and not recommended for exact measurement.

RECOMMENDED TECHNIQUE FOR AUTOMATED OFFICE BLOOD PRESSURE (AOBP)

- Measurements should be taken in a sitting position with the back supported using a validated device known to be accurate.
- BP should be taken in both arms on at least one visit and if one arm has a consistently higher pressure, that arm should be used for BP measurement and interpretation.

AOBP Threshold for diagnosis:
A mean SBP $\geq$135 mmHg or DBP $\geq$85 mmHg.

- A cuff with an appropriate bladder size for the size of the arm should be chosen: bladder width should be close to 40% of the arm circumference and length should cover 80-100% of the arm circumference.
- The arm should be bare, supported, and kept at heart level.
- The lower edge of the cuff should sit 3 cm above the elbow crease with the bladder centred over the brachial artery.
- The patient's legs should be uncrossed with feet flat on the floor.
- There should be no talking and the room should be quiet.
- The device should be set to take measures at 1-to 2-minute intervals.
- The first measurement should be taken to verify cuff position and validity of the measurement.
- The patient should be left alone after the first measurement while the device automatically takes subsequent readings.
- The average BP as displayed on the electronic device should be recorded, as well as the arm used and whether the patient was supine, sitting or standing.

RECOMMENDED TECHNIQUE FOR NON-AUTOMATED OFFICE BLOOD PRESSURE (NON-AOBP)

- Measurements should be taken with a device known to be accurate.
- BP should be taken in both arms on at least one visit and if one arm has a consistently higher pressure, that arm should be used for BP measurement and interpretation.
- A recently calibrated aneroid device or sphygmomanometer should be used. Ensure the device is clearly visible at eye level.
- A cuff with an appropriate bladder size for the size of the arm should be chosen: bladder width should be close to 40% of the arm circumference and length should cover 80-100% of the arm circumference.
- The arm should be bare, supported, and kept at heart level.
- The lower edge of the cuff should sit 3 cm above the elbow crease with the bladder centred over the brachial artery.
- The patient should rest comfortably for 5 minutes prior to the measurement in the seated position with their back supported.
- The patient's legs should be uncrossed with feet flat on the floor.
- There should be no talking and the room should be quiet.
- The first reading should be discarded and the latter two averaged.

Non-AOBP threshold for diagnosis:
A mean SBP ≥140 mmHg and/or DBP ≥90 mmHg.

Threshold for Diagnosis in Diabetes:
A mean SBP ≥130 mmHg and/or DBP ≥80 mmHg.

Take note:

Record BP to the closest 2 mmHg on the sphygmomanometer, as well as the arm used and whether the patient was supine, sitting or standing.

Record the heart rate.

Seated vs. Standing

The seated BP is used to determine and monitor treatment decisions.

The standing BP is used to examine for postural hypotension, which may modify treatment.

What About Auscultation?

- Increase pressure rapidly to 30 mmHg above the level at which the radial pulse is extinguished.
- Place the bell or diaphragm of the stethoscope gently and steadily over the brachial artery.
- Open the control valve so that the rate of deflation of the cuff is approximately 2 mmHg per heart beat.
- The systolic level is the first appearance of a clear tapping sound (phase I Korotkoff).
- The diastolic level is the point at which the sounds disappear (phase V Korotkoff).
- In the case of arrhythmia, additional readings with auscultation may be required to estimate the average systolic and diastolic pressure. Isolated extra beats should be ignored. Note the rhythm and pulse rate.

Tips:

If Korotkoff sounds continue as the level approaches 0 mmHg, listen for when the sound becomes muffled to indicate the diastolic pressure.

Leaving the cuff partially inflated for too long will make sounds difficult to hear. Leave 1 minute between readings for optimal results.

HOME BLOOD PRESSURE MONITORING

Home blood pressure (home BP) monitoring can be used in the diagnosis of hypertension, and monitoring on regular basis should be considered for hypertensive patients with:

- Diabetes mellitus
- Chronic kidney disease
- Suspected non-adherence
- Demonstrated or suspected white coat effect
- BP controlled in the office but not at home (masked hypertension)

Home BP threshold for diagnosis:

SBP $\geq$135 mmHg or DBP $\geq$85 mmHg should be considered elevated and associated with increased overall mortality risk.

If white coat or masked hypertension is suggested by home BP, it should be confirmed by repeat home or ambulatory BP monitoring before treatment decisions are made.

BP Home Series

White coat or sustained hypertension values should be based on duplicate measures, morning and evening for seven days. First day values should be discarded.

Log the Results

Hypertension Canada offers free downloadable blood pressure logs for health care professionals and patients at hypertension.ca.

Date		Time	Comments	Heart Rate (beats/min)	BP Reading #1		BP Reading #2	
					Systolic	Diastolic	Systolic	Diastolic
June 15	Sample Morning	8:00 a.m.	Meds at 9 a.m.		138	82	135	80
	Sample Evening	8:00 p.m.	Upset		151	92	154	90
	Day 1 Morning							
	Day 1 Evening							
	Day 2 Morning							
	Day 2 Evening							
	Day 3 Morning							
	Day 3 Evening							

Hypertension Canada's Device Recommendation Program

Refer patients to Hypertension Canada's list of devices validated as accurate at hypertension.ca. Home blood pressure monitors will begin to carry these logos on their packaging in 2018.

Have your patients look for the following logos to ensure their home BP monitor is valid and has been verified by Hypertension Canada. Both Gold and Silver ratings are accepted as accurate.

Gold-rated devices meet the highest and most current international standard for blood pressure measurement devices.

Silver-rated devices meet the highest international standards available prior to the most recent updates.

AMBULATORY BLOOD PRESSURE MONITORING

Ambulatory blood pressure monitoring (ABPM) can be used in the diagnosis of hypertension and should be considered when an office-induced increase in BP (white coat effect) is suspected in treated patients with:

- BP that is not below target, despite receiving appropriate chronic anti-hypertensive therapy
- Symptoms suggestive of hypotension
- Fluctuating office BP readings

ABPM Threshold for diagnosis:

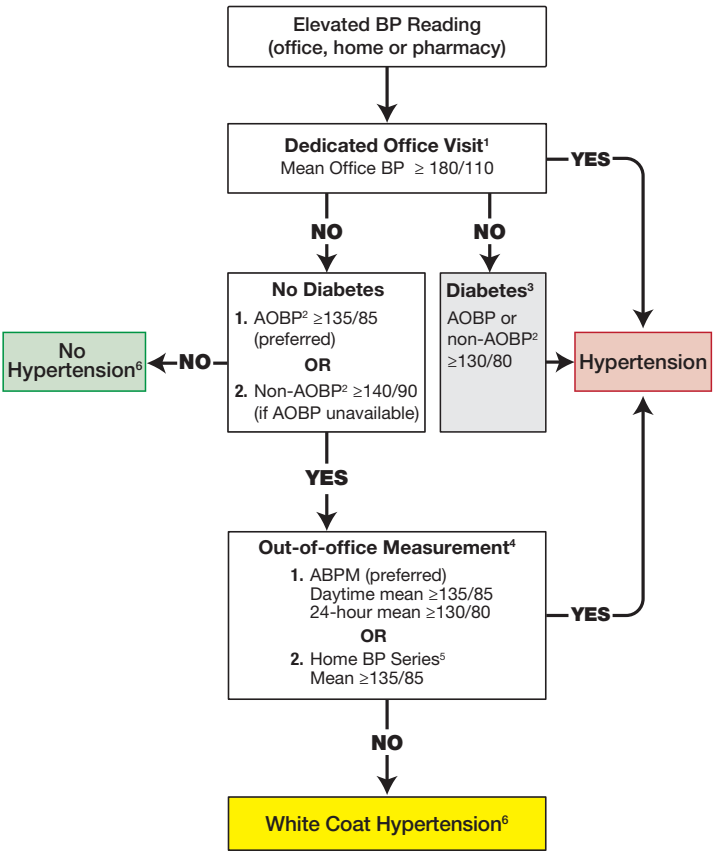
A mean 24-hour SBP $\geq$130 mmHg and/or DBP $\geq$80 mmHg.

OR

A mean daytime SBP $\geq$135 mmHg and/or DBP $\geq$85 mmHg.

The magnitude of changes in nocturnal BP should be taken into consideration when determining whether to prescribe or withhold drug therapy based upon ambulatory BP monitoring. A decrease in nocturnal BP of <10% is associated with increased risk of cardiovascular events.

Hypertension Diagnostic Algorithm for Adults



Algorithm Notes:

1) If AOBP is used, use the mean calculated and displayed by the device. If non-AOBP (see note 2) is used, take at least three readings, discard the first and calculate the mean of the remaining measurements. A history and physical exam should be performed and diagnostic tests ordered.

2) **AOBP** = Automated Office BP. This is performed with the patient unattended in a private area.
Non-AOBP = Non-automated measurement performed using an electronic upper arm device with the provider in the room.

3) Diagnostic thresholds for AOBP, ABPM, and home BP in patients with diabetes have yet to be established (and may be lower than 130/80 mmHg).

4) Serial office measurements over 3-5 visits can be used if ABPM or home measurement not available.

5) Home BP Series: Two readings taken each morning and evening for 7 days (28 total).
Discard first day readings and average the last 6 days.

6) Annual BP measurement is recommended to detect progression to hypertension.

ABPM: Ambulatory Blood Pressure Measurement

AOBP: Automated Office Blood Pressure

II. ASSESSMENT

BP should be assessed in all adult patients at all appropriate visits to determine cardiovascular risk and monitor antihypertensive treatment.

Routine Lab Testing

Preliminary investigations of patients with hypertension

1. Urinalysis
2. Blood chemistry (potassium, sodium and creatinine)
3. Fasting blood glucose and/or glycated hemoglobin (A1c)
4. Serum total cholesterol, low-density lipoprotein (LDL), high-density lipoprotein (HDL), non-HDL cholesterol, and triglycerides; lipids may be drawn fasting or non-fasting
5. Standard 12-lead ECG

Routine testing of microalbuminuria in patients with hypertension by without diabetes or renal disease is not supported by current evidence.

Follow-up investigations of patients with hypertension

During the maintenance phase of hypertension management, tests (including electrolytes, creatinine, glucose/A1c, and fasting lipids) should be repeated with a frequency reflecting the clinical situation.

Diabetes develops in 1-3% per 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 β-Blockers, impaired fasting glucose or impaired glucose tolerance, obesity (especially abdominal), dyslipidemia, sedentary lifestyle and poor dietary habits. Screen adults with hypertension with annual fasting plasma glucose testing and follow the screening recommendations.

For diabetes management visit: guidelines.diabetes.ca/fullguidelines

Target Organ Damage

Target Organ Damage (TOD) should be assessed in patients with hypertension. Presence of any of the following would put a patient into the moderate-to-high or high-risk categories for therapy.

Cardiovascular disease

- Coronary Artery Disease
  - Acute coronary syndromes
  - Angina pectoris
  - Myocardial infarction
- Heart Failure
- Left Ventricular Dysfunction
- Left Ventricular Hypertrophy

When to check?

If the mean AOBP or non-AOBP measurement is high during visit 1, a history and physical examination should be performed and, if clinically indicated, diagnostic tests to search for TOD should be arranged within 2 visits.

Cerebrovascular Disease

- Aneurysmal sub-arachnoid hemorrhage
- Dementia
- Intracerebral hemorrhage
- Ischemic stroke or transient ischemic attack
  - Vascular dementia
    - Mixed vascular dementia and dementia of the Alzheimer's type

Hypertensive Retinopathy

Peripheral Arterial Disease

- Intermittent claudication

Renal Disease

- Albuminuria
- Chronic Kidney Disease (GFR < 60 ml/min/1.73 m^2)

Global Cardiovascular Risk Assessment

Global cardiovascular risk should be assessed. Multifactorial risk assessment models can be used to more accurately predict global cardiovascular risk and antihypertensive therapy.

Assessments can be done through risk calculators like:

- www.ccs.ca/en/resources/calculators-forms
- www.myhealthcheckup.com
- www.score-canada.ca

Improve Risk Factor Modification

Inform patients of their global risk and consider using analogies that describe comparative risks like "cardiovascular age", "vascular age", or "heart age".

Populations and stratification

Hypertension Canada stratifies patients by cardiovascular risk and, based on that risk, there are different thresholds and targets for treatment.

Hypertension Canada *High-Risk* Patient*

Diabetes Mellitus

Moderate-to-high Risk
(multiple cardiovascular risk factors & 10-year global risk > 15%)

Low Risk
(no TOD or cardiovascular risk factors)

*** Hypertension Canada *High-Risk* Patient**

Individuals with one or more of the following clinical indications should consent to intensive management:

- ✓ Clinical or sub-clinical cardiovascular disease

OR

- ✓ Chronic kidney disease (non-diabetic nephropathy, proteinuria <1g/d, *estimated glomerular filtration rate 20-59 mL/min/1.73m²)

OR

- ✓ Estimated 10-year global cardiovascular risk ≥15%

OR

- ✓ Age ≥75 years

Thresholds and Targets

In patients with documented hypertension, attaining blood pressure targets is vital to prevent cardiovascular and cerebrovascular complications.

Blood pressure thresholds for initiation of antihypertensive therapy and treatment targets in adults:

Patient Population	BP threshold for initiation of antihypertensive therapy		BP treatment target	
	SBP mmHg	DBP mmHg	SBP mmHg	DBP mmHg
Hypertension Canada High-Risk Patient*	≥ 130	N/A	< 120	N/A
Diabetes mellitus**	≥ 130	≥ 80	< 130	< 80
Moderate-to-high Risk (TOD or CV risk factors)**	≥ 140	≥ 90	< 140	< 90
Low Risk (No TOD or CV risk factors)**	≥ 160	≥ 100	< 140	< 90

* BP treatment threshold and target based on AOBP measurements
**BP treatment thresholds and targets refer to non-AOBP measurements performed in office.

I. TREATMENT

Health Behaviour Recommendations

Objective	Recommendation	Application
Being More Physically Active	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. For non-hypertensive or stage-1 hypertensive individuals, the use of resistance or weight training exercise (such as free weight lifting, fixed weight lifting, or hand grip exercise) does not adversely influence BP.	Prescribe to both normotensive and hypertensive individuals for prevention and management of hypertension, respectively.
Weight Reduction	A healthy BMI (18.5 – 24.9 kg/m^2) and waist circumference (<102 cm for men and <88 cm for women) is recommended for non-hypertensive individuals to prevent hypertension and for hypertensive patients to reduce BP.	Encourage multidisciplinary approach to weight loss, including dietary education, increased physical activity, and behaviour modification.
Moderation in Alcohol Intake	Limited consumption: 0-2 standard drinks/day • Men: <14 drinks/week • Women: <9 drinks/week	Prescribe to both normotensive and hypertensive individuals for prevention and management of hypertension, respectively.
Eating Healthier	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 in cholesterol. • To decrease BP in hypertensive patients, consider increasing dietary potassium.	Prescribe to both normotensive and hypertensive individuals for the prevention and management of hypertension, respectively.
Relaxation Therapies	Individualized cognitive behaviour interventions are more likely to be effective when relaxation techniques are employed.	Prescribe for selected patients in whom stress plays a role in elevating BP.
Smoking Cessation	Advise smokers to quit and offer them specific pharmacotherapy to help them quit. Abstinence from smoking. A smoke-free environment.	Global cardiovascular risk reduction strategy.

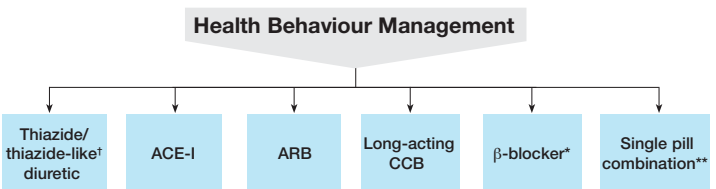
Health Behaviours

For both the prevention and management of hypertension, health behaviour strategies have been proven to effectively lower BP. Health behaviours can be beneficial to individualized therapy. Individuals should be engaged in conversation about health behaviour changes and informed on how life style adjustments can help to lower their BP. Encourage them to start today.

Hypertension Canada has resources available to use with your patients at hypertension.ca.

First Line Treatment of Adults with Systolic/Diastolic Hypertension Without Other Compelling Indications

TARGET <140/90 mmHg (non-automated measurement method)
Initial Treatment



† Long-acting diuretics like indapamide and chlorthalidone are preferred over shorter acting diuretics like hydrochlorothiazide.

* β-blockers are not indicated as first-line therapy for age 60 and above.

**** Recommended SPC choices are those in which an ACE-I is combined with a CCB, an ARB with a CCB, or a CE-I or ARB with a diuretic**

Renin angiotensin system (RAS) inhibitors are contraindicated in pregnancy and caution is required in prescribing to women of child bearing potential

Combination Therapy

To achieve optimal blood pressure targets:

- Multiple drugs are often required to reach target levels, especially in patients with Type 2 diabetes.
- Replace multiple antihypertensive agents with single pill combination therapy.
- Single pill combinations or monotherapy should be considered for initial antihypertensive therapy.
- Low doses of multiple drugs may be more effective and better tolerated than higher doses of fewer drugs.
- Reassess patients with uncontrolled BP at least every two months.
- The combination of ACE inhibitors and ARBs should not be used.
- In 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.

Suspected Resistant Hypertension

- Consider white coat hypertension and non-adherence.
- Diuretic therapy should be considered if not already prescribed or contraindicated.
- β-Blockers, when used in addition to ACE inhibitors or ARBs, have not been shown to have a clinically important effect on BP.
- Monitor creatinine and potassium when combining potassium sparing diuretics, ACE inhibitors and/or ARBs.
- Consider referral to a hypertension specialist if BP is still not controlled after treatment with three antihypertensive medications.

Considerations in the individualization of pharmacological therapy in adults

	Initial therapy	Second-line therapy	Notes and/or cautions
Hypertension without other compelling indications			
Diastolic hypertension with or without systolic hypertension	Monotherapy or SPC. Recommended monotherapy choices include thiazide/thiazide-like diuretics (with longer-acting diuretics preferred), ß-blockers, ACE inhibitors, ARBs, or long-acting CCBs. Recommended SPC choices include combinations of an ACE inhibitor with CCB, ARB with CCB, or ACE inhibitor/ARB with a diuretic. (Consider ASA and statins in selected patients.)	Further addition of first-line drugs.	Not recommended for monotherapy: α-blockers, ß-blocker in those ≥60 years of age, ACE inhibitors in black people. Hypokalemia should be avoided in those prescribed diuretics. ACE inhibitors, ARBs and direct renin inhibitors are potential teratogens, and caution is required if prescribing to women with child-bearing potential. Combination of an ACE inhibitor with an ARB is not recommended.
Isolated systolic hypertension without other compelling indications	Thiazide/thiazide-like diuretics, ARBs or long-acting dihydropyridine CCBs.	Combinations of first-line drugs.	Same as diastolic hypertension with or without systolic hypertension.
Diabetes mellitus			
Diabetes mellitus with microalbuminuria*, renal disease, CVD or additional CV risk factors	ACE inhibitors or ARBs.	Addition of a dihydropyridine CCB is preferred over a thiazide/thiazide-like diuretic.	A loop diuretic could be considered in hypertensive chronic kidney disease patients with extracellular fluid volume overload.
Diabetes mellitus without factors listed above	ACE inhibitors, ARBs, dihydropyridine CCBs or thiazide/thiazide-like diuretics.	Combination of first-line drugs. If combination with ACE inhibitor is being considered, a dihydropyridine CCB is preferable to a thiazide/thiazide-like diuretic.	Normal urine microalbumin to creatinine ratio <2.0 mg/mmol.

	Initial therapy	Second-line therapy	Notes and/or cautions
Cardiovascular disease			
Coronary artery disease	ACE inhibitors or ARBs; ß-blockers or CCBs for patients with stable angina.	When combination therapy is being used for high risk patients, an ACE inhibitor/ dihydropyridine CCB is preferred.	Avoid short-acting nifedipine. Combination of an ACE inhibitor with an ARB is specifically not recommended. Exercise caution when lowering SBP to target if DBP is ≤60 mm Hg, especially in patients with LVH.
Recent myocardial infarction	ß-blockers and ACE inhibitors (ARBs if ACE inhibitor intolerant).	Long-acting CCBs if ß-blocker contraindicated or not effective.	Non-dihydropyridine CCBs should not be used with concomitant heart failure.
Heart failure	ACE inhibitors (ARBs if ACE inhibitor-intolerant) and ß-blockers. Aldosterone antagonists (mineralocorticoid receptor antagonists) may be added for patients with a recent cardiovascular hospitalization, acute myocardial infarction, elevated BNP or NT-proBNP level, or NYHA Class II to IV symptoms.	ACE inhibitor and ARB combined. Hydralazine/ isosorbide dinitrate combination if ACE inhibitor and ARB contraindicated or not tolerated. Thiazide/thiazide-like or loop diuretics are recommended as additive therapy. Dihydropyridine CCB can also be used. A combined ARB/neprilysin-inhibitor is recommended (in place of an ACE inhibitor or ARB) in symptomatic patients with hypertension and HFrEF on standard guideline-based therapies.	Titrate doses of ACE inhibitors and ARBs to those used in clinical trials. Carefully monitor potassium and renal function if combining any of ACE inhibitor, ARB and/or aldosterone antagonist.

	Initial therapy	Second-line therapy	Notes and/or cautions
Cardiovascular Disease (continued)			
Left ventricular hypertrophy	ACE inhibitor, ARB, long-acting CCB or thiazide/thiazide-like diuretics.	Combination of additional agents.	Hydralazine and minoxidil should not be used.
Past stroke or TIA	ACE inhibitor and a thiazide/thiazide-like diuretic combination.	Combination of additional agents.	Treatment of hypertension should not be routinely undertaken in acute stroke unless extreme BP elevation. Combination of an ACE inhibitor with an ARB is not recommended.
Non-diabetic chronic kidney disease			
Non-diabetic chronic kidney disease with proteinuria†	ACE inhibitors (ARBs if ACE inhibitor-intolerant) if there is proteinuria. Diuretics as additive therapy.	Combinations of additional agents.	Carefully monitor renal function and potassium for those on an ACE inhibitor or ARB. Combinations of an ACE inhibitor and ARB are not recommended in patients without proteinuria.
Renovascular disease	Does not affect initial treatment recommendations. Atherosclerotic renal artery stenosis should be primarily managed medically, while revascularization should be considered for renal fibromuscular dysplasia.	Combinations of additional agents.	Caution with ACE inhibitors or ARB if bilateral renal artery stenosis or unilateral disease with solitary kidney. Renal artery angioplasty and stenting could be considered for patients with renal artery stenosis and complicated, uncontrolled hypertension.

	Initial therapy	Second-line therapy	Notes and/or cautions
Other conditions			
Peripheral arterial disease	Does not affect initial treatment recommendations.	Combinations of additional agents.	Avoid ß-blockers with severe disease.
Dyslipidemia	Does not affect initial treatment recommendations.	Combinations of additional agents.	–
Overall vascular protection	Statin therapy for patients with 3 or more cardiovascular risk factors or atherosclerotic disease. Low dose ASA in patients ≥50 years. Advise on smoking cessation and use pharmacotherapy for smoking cessation if indicated.	–	Caution should be exercised with the ASA recommendation if BP is not controlled.

* Microalbuminuria is defined as persistent albumin to creatinine ratio >2.0 mg/mmol.

† Proteinuria is defined as urinary protein >500 mg/24hr or albumin to creatinine ratio [ACR] >30 mg/mmol in two of three specimens.

ACE: Angiotensin converting enzyme

ARB: Angiotensin receptor blocker

ASA: Acetylsalicylic acid

CCB: Calcium channel blocker

CVD: Cardiovascular disease

HFrEF: Heart failure with reduced ejection fraction < 40%

NYHA: New York Heart Association

TIA: Transient ischemic attack

LVH: Left ventricular hypertrophy

SPC: Single pill combination

II. Adherence

Improve patient adherence using a multi-pronged approach.

1. Consider tailoring or simplifying pill-taking to fit your patient's daily habits.
2. Have your patient get involved in his/her treatment by encouraging greater responsibility or autonomy in monitoring BP and reporting the results.
3. Improve management in the office and beyond by assessing adherence to therapy at every visit and utilizing the patient's interprofessional team to monitor progress.

Possible reasons for poor response to antihypertensive therapy

- **Inaccurate measurement**
- **Suboptimal Treatment Regimens**
  - Dosage too low
  - Inappropriate combinations of antihypertensive agents
- **Poor Adherence**
  - Dietary
  - Physical activity
  - Medication
- **Associated Conditions**
  - Obesity
  - Tobacco use
  - Excessive alcohol consumption
  - Sleep apnea
  - Chronic pain

(continued on next page)

- **Drug Interactions**
  - Nonsteroidal anti-inflammatory drugs
  - Oral contraceptives
  - Corticosteroids and anabolic steroids
  - Cocaine
  - Amphetamines
  - Erythropoietin
  - Cyclosporine, tacrolimus
  - Licorice
  - Over-the-counter dietary supplements
  - Oral decongestant use (pseudoephedrine)
  - Monoamine oxidase inhibitors, certain selective serotonin reuptake inhibitors
- **Secondary Hypertension**
  - Renal insufficiency
  - Renovascular disease
  - Primary hyperaldosteronism
  - Thyroid disease
  - Pheochromocytoma and other rare endocrine causes
  - Obstructive sleep apnea

FOLLOW UP

Measurement

Standardized office blood pressure measurement should be used for follow up. Measurement using electronic (oscillometric) upper arm devices is preferred over auscultation.

White coat effect

Ambulatory or home blood pressure monitoring is recommended for follow up in patients with demonstrated white coat effect.

Modifying health behaviours

Patient follow up every 3-6 months to monitor active modifications.

For patients with BP not at target, visits every 1-2 months are recommended

Antihypertensive medication

Patients on antihypertensive drug treatment should be seen every 1-2 months, depending on the level of BP, until readings on 2 consecutive visits are below their target.

When the target BP has been reached, patients should be seen at 3- to 6-month intervals.

Follow up frequency should always reflect the individual's clinical situation

Shorter intervals between visits will be needed for symptomatic patients and those with severe hypertension, intolerance to antihypertensive drugs, or target organ damage.

Professional Resources

Hypertension Canada's professional resources help keep you at the leading edge in hypertension prevention, diagnosis and care.

- Hypertension Canada Guidelines
- Accredited scientific meetings
- Accredited primary care CME programs
- Learning and teaching resources
- eINFO newsletter

Information for Patients

Hypertension Canada develops resources for you to use with your patients that reinforce these guidelines in an easy-to-understand format. Information designed for the public can be accessed online by patients at www.hypertension.ca. Bulk orders of patient resources can be purchased on our website, with discounts available for members.

Join the Hypertension Canada Community

Hypertension Canada is a like-minded community of professionals that shapes research, education and public policy.

Visit www.hypertension.ca to join us today.

Notes

Notes





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