

Medi Quest BRS Hospital

A monthly News letter from BRS Hospital

HYPERTENSION PRACTICE GUIDELINES

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INTRODUCTION

Hypertension is a major cause of cardiovascular disease and deaths worldwide especially in low and middle income countries. Despite the availability of safe, well-tolerated, and cost effective blood pressure lowering therapies, <14% of adults with hypertension have BP controlled to a systolic/diastolic BP <140/90mm Hg. We report new hypertension practice guidelines by International society of Hypertension- Global hypertension practice guidelines 2020 from AHA journal.

In this edition of Mediquest we are discussing the definition, diagnosis of hypertension, evaluation of secondary hypertension. In the coming edition, management of hypertensive emergency, urgencies and treatment of essential hypertension and resistant hypertension shall be discussed.

DEFINITION - In accordance with most major guidelines it is recommended that hypertension be diagnosed when a person's systolic blood pressure is > 140mm Hg and/or their diastolic blood pressure is > 90mm Hg following repeated examination

CLASSIFICATION OF HYPERTENSION BASED

IN OFFICE BP MEASUREMENT

| Category | Systolic | Diastolic |
|----------------------|----------|-----------|
| Normal | < 130 | < 85 |
| High Normal | 130-139 | 85-89 |
| Grade 1 Hypertension | 140-159 | 90-99 |
| Grade 2 Hypertension | > 160 | > 100 |

BLOOD PRESSURE MEASUREMENT AND

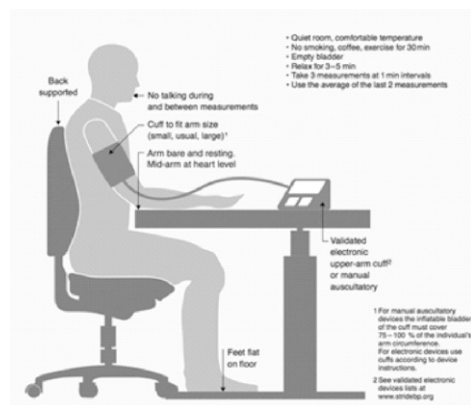
DIAGNOSIS OF HYPERTENSION

The measurement of BP in the office or clinic is most commonly the basis for hypertension diagnosis and follow up. Whenever possible, the diagnosis should not be made on a single office visit. Usually 2-3 office visits at 1-4-week intervals (depending on the BP level) are required to confirm the diagnosis of hypertension.

The diagnosis might be made on a single visit, if BP is \geq 180/110 mm Hg and there is evidence of cardiovascular disease (CVD).

If possible and available, the diagnosis of hypertension should be confirmed by out-of-office BP measurement

MEASUREMENT OF BLOOD PRESSURE



HYPERTENSION DIAGNOSIS – OFFICE BLOOD PRESSURE MEASUREMENT

Initial evaluation: Measure BP in both arms, preferably simultaneously. If there is a consistent difference between arms >10 mm Hg in repeated measurements, use the arm with the higher BP. If the difference is >20 mm Hg consider further investigation.

Standing blood pressure: Measure in treated hypertensives after 1 min and again after 3 min when there are symptoms suggesting postural hypotension and at the first visit in the elderly and people with diabetes.

Unattended office blood pressure: Multiple automated BP measurements taken while the patient remains alone in the office provide a more standardized evaluation but also lower BP levels than usual office measurements with uncertain threshold for hypertension diagnosis. Confirmation with out-of-office BP is again needed for most treatment decisions.

HYPERTENSION DIAGNOSIS – OUT-OF-OFFICE BLOOD PRESSURE MEASUREMENT

Out-of-office BP measurements (by patients at home or with 24-hour ambulatory blood pressure monitoring [ABPM]) are more reproducible than office measurements, more closely associated with hypertension-induced organ damage and the risk of cardiovascular events and identify the white coat and masked hypertension phenomena (see below).

Out-of-office BP measurement is often necessary for the accurate diagnosis of hypertension and for treatment decisions. In untreated or treated subjects with office BP classified as high-normal BP or grade 1 hypertension (systolic 130–159 mm Hg and/or diastolic 85–99 mm Hg), the BP level needs to be confirmed using home or ambulatory BP monitoring.

Blood Pressure Measurement and Diagnosis of Hypertension

OPTIMAL



| | Home BP Monitoring | Ambulatory BP Monitoring |
|----------------------|---|--|
| Conditions | As for office blood pressure (see above). | Routine working day. |
| Position | As for office BP (see above). | Avoid strenuous activity. Arm still and relaxed during each measurement. |
| Device | Validated electronic (oscillometric) upper-arm cuff device (www.stridebp.org, and Section 11: Resources) | |
| Cuff | Size according to the individual's arm circumference | |
| Measurement protocol | <p>Before each visit to the health professional:</p> <ul style="list-style-type: none"> 3–7-day monitoring in the morning (before drug intake if treated) and the evening. Two measurements on each occasion after 5 min sitting rest and 1 min between measurements. <p>Long-term follow-up of treated hypertension:</p> <ul style="list-style-type: none"> 1–2 measurements per week or month. | <ul style="list-style-type: none"> 24-hour monitoring at 15–30 min intervals during daytime and nighttime. At least 20 valid daytime and 7 nighttime BP readings are required. If less, the test should be repeated. |
| Interpretation | <ul style="list-style-type: none"> Average home blood pressure after excluding readings of the first day ≥ 135 or 85 mmHg indicates hypertension. | <ul style="list-style-type: none"> 24-hour ambulatory blood pressure $\geq 130/80$ mmHg indicates hypertension (primary criterion). Daytime (awake) ambulatory blood pressure $\geq 135/85$ mmHg and nighttime (asleep) $\geq 120/70$ mmHg indicates hypertension |

The use of office and out-of-office (home or ambulatory) BP measurements identifies individuals with white coat hypertension, who have elevated BP only in the office (non-elevated ambulatory or home BP), and those with masked hypertension, who have non-elevated BP in the office but elevated BP out of the office (ambulatory or home). These conditions are common among both untreated subjects and those treated for hypertension. About 10%–30% of subjects attending clinics due to high BP have white coat hypertension and 10%–15% have masked hypertension.

White coat hypertension: These subjects are at intermediate cardiovascular risk between normotensives and sustained hypertensives. The diagnosis needs confirmation with repeated office and out-of-office BP measurements. If their total cardiovascular risk is low and there is no hypertension-mediated organ damage (HMOD), drug treatment may not be prescribed. However, they should be followed with lifestyle modification, as they may develop sustained hypertension requiring drug treatment.

Masked hypertension: These patients are at similar risk of cardiovascular events as sustained hypertensives. The diagnosis needs confirmation with repeated office and out-of-office measurements. Masked hypertension may require drug treatment aiming to normalize out-of-office BP

DIAGNOSTIC AND CLINICAL TESTS FOR HYPERTENSION AS WELL AS HMOD

Medical History : New onset hypertension/duration of hypertension , Risk factors, co-morbidities, signs/symptoms of secondary hypertension.

Physical examination: Circulation and cardiac examination, other organs/systems- enlarged kidneys, neck circumference > 40cm(obstructive sleep apnea), enlarged thyroid, increased body mass index, waist circumference, fatty deposits and coloured striae(Cushing disease/syndrome).

Laboratory investigations and ECG :

Sodium, potassium, serum creatinine, eGFR, Lipid profile and fasting glucose.

Dipstick urine test, 12 lead ECG(detection of Atrial fibrillation , LVH, Ischemic heart disease.

Additional investigations:

Echocardiography: LVH, systolic/diastolic dysfunction, atrial dilation, aortic coarctation.

Carotid ultrasound: Plaques (atherosclerosis), stenosis.

Kidneys/renal artery and adrenal imaging: Ultrasound/renal artery Duplex; CT-/MR-angiography: renal parenchymal disease, renal artery stenosis, adrenal lesions, other abdominal pathology.

Fundoscopy: Retinal changes, hemorrhages, papilledema, tortuosity, nipping.

Brain CT/MRI: Ischemic or hemorrhagic brain injury due to hypertension.

Functional Tests and Additional Laboratory Investigations

Ankle-brachial index: Peripheral (lower extremity) artery disease.

• Further testing for secondary hypertension if suspected: Aldosterone-renin ratio, plasma free metanephrines, late-night salivary cortisol or other screening tests for cortisol excess.

Urinary albumin/creatinine ratio

Serum uric acid (s-UA) levels

Liver function tests

Cardiovascular Risk Factors

CV risk assessment is important and should be assessed in all hypertensive patients.

More than 50% of hypertensive patients have additional cardiovascular risk factors.

The most common additional risk factors are diabetes (15%–20%), lipid disorders (elevated low-density lipoprotein-cholesterol [LDL-C] and triglycerides [30%]), overweight-obesity (40%), hyperuricemia (25%) and metabolic syndrome (40%), as well as unhealthy lifestyle habits

(eg, smoking, high alcohol intake, sedentary lifestyle). Also consider increased risk in patients with hypertension and chronic inflammatory diseases, chronic obstructive pulmonary disease (COPD), psychiatric disorders, psychosocial stressors where an effective BP control is warranted

The presence of one or more additional cardiovascular risk factors proportionally increases the risk of coronary, cerebrovascular, and renal diseases in hypertensive patients.

SECONDARY HYPERTENSION

A specific cause of secondary hypertension can be identified in 5%–10% of hypertensive patients. The most common types of secondary hypertension in adults are renal parenchymal disease, renovascular hypertension, primary aldosteronism, chronic sleep apnea, and substance/drug-induced.

Recommendations

Consider screening for secondary hypertension in

- (1) patients with early onset hypertension (<30 years of age) in particular in the absence of hypertension risk factors (obesity, metabolic syndrome, familial history etc.),
- (2) those with resistant hypertension,
- (3) individuals with sudden deterioration in BP control,
- (4) hypertensive urgency and emergency, (5) those presenting with high probability of secondary hypertension based on strong clinical clues.

In patients with resistant hypertension, investigations for secondary hypertension should generally be preceded by exclusion of pseudoresistant hypertension and drug/substance-induced hypertension.

Basic screening for secondary hypertension should include a thorough assessment of history, physical examination (see clinical clues), basic blood biochemistry (including serum sodium, potassium, eGFR, TSH), and dipstick urine analysis.

Further investigations for secondary hypertension (additional biochemistry/imaging/others) should be carefully chosen based on information from history, physical examination and basic clinical investigations.

Consider referring for further investigation and management of suspected secondary hypertension to a specialist center with access to appropriate expertise and resources.

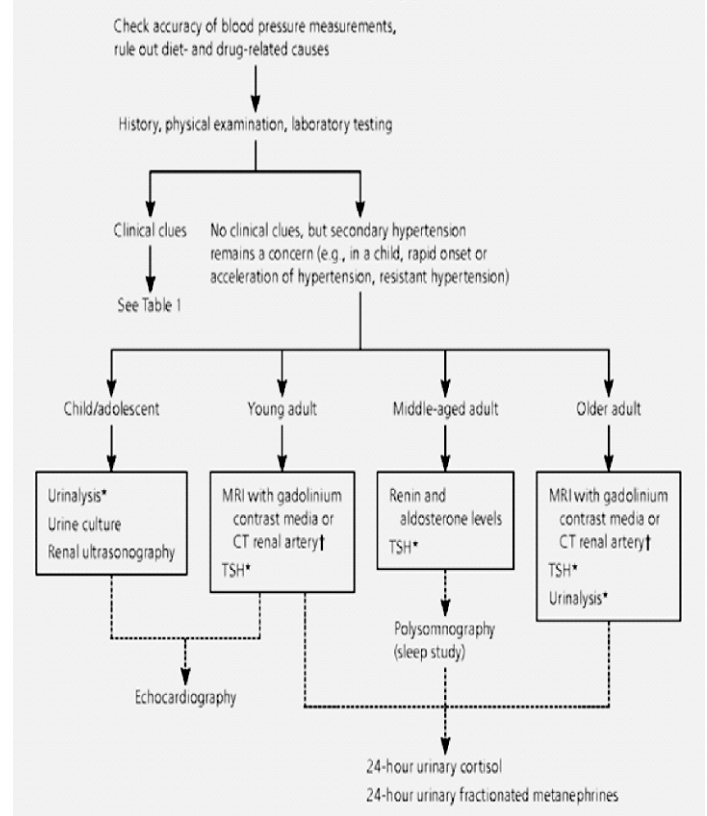
Table 1. Signs and Symptoms That Suggest Specific Causes of Secondary Hypertension

| Signs/symptoms | Possible secondary hypertension cause | Diagnostic test options |
|---|---------------------------------------|---|
| Arm to leg systolic blood pressure difference > 20 mm Hg Delayed or absent femoral pulses Murmur | Coarctation of the aorta | Magnetic resonance imaging (adults) Transthoracic echocardiography (children) |
| Increase in serum creatinine concentration (≥ 0.5 to 1 mg per dL [44.20 to 88.40 μmol per L]) after starting angiotensin-converting enzyme inhibitor or angiotensin receptor blocker Renal bruit | Renal artery stenosis | Computed tomography angiography Doppler ultrasonography of renal arteries Magnetic resonance imaging with gadolinium contrast media |
| Bradycardia/tachycardia Cold/heat intolerance Constipation/diarrhea Irregular, heavy, or absent menstrual cycle | Thyroid disorders | Thyroid-stimulating hormone |
| Hypokalemia | Aldosteronism | Renin and aldosterone levels to calculate aldosterone/renin ratio |
| Apneic events during sleep Daytime sleepiness Snoring | Obstructive sleep apnea | Polysomnography (sleep study) Sleep Apnea Clinical Score with nighttime pulse oximetry |
| Flushing Headaches Labile blood pressures Orthostatic hypotension Palpitations Sweating Syncope | Pheochromocytoma | 24-hour urinary fractionated metanephrines Plasma free metanephrines |
| Buffalo hump Central obesity Moon facies Striae | Cushing syndrome | 24-hour urinary cortisol Late-night salivary cortisol Low-dose dexamethasone suppression |

Most common causes of Secondary hypertension

| Age groups | Percentage of hypertension with an underlying cause | Most common etiologies† |
|-------------------------------------|---|---|
| Children (birth to 12 years) | 70 to 85 | Renal parenchymal disease Coarctation of the aorta |
| Adolescents (12 to 18 years) | 10 to 15 | Renal parenchymal disease Coarctation of the aorta |
| Young adults (19 to 39 years) | 5 | Thyroid dysfunction Fibromuscular dysplasia Renal parenchymal disease |
| Middle-aged adults (40 to 64 years) | 8 to 12 | Aldosteronism Thyroid dysfunction Obstructive sleep apnea Cushing syndrome Pheochromocytoma |
| Older adults (65 years and older) | 17 | Atherosclerotic renal artery stenosis Renal failure Hypothyroidism |

Evaluation for Suspected Secondary Hypertension



In the coming edition of Mediquest management of essential hypertension will be discussed together with management of hypertensive emergency, urgency and resistant hypertension.