



# Hypertension

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# Prevalence

- The global prevalence of hypertension is high, and among nonpregnant adults, treatment of hypertension is the most common reason for office visits and for the use of chronic prescription medications.
- In addition, roughly one-half of hypertensive individuals do not have adequate blood pressure control.

# Measurement of BP

Office-based BP  
measurement

Ambulatory BP  
monitoring (ABPM)

Home BP monitoring

# Office-based BP measurement

## Step 1: Properly prepare the patient

1. Have the patient relax, sitting in a chair (feet on floor, back supported) for >5 minutes.
2. The patient should avoid caffeine, exercise, and smoking for at least 30 minutes before measurement.
3. Ensure patient has emptied their bladder.
4. Neither the patient nor the observer should talk during the rest period or during the measurement.
5. Remove all clothing covering the location of cuff placement.

## Step 2: Use proper technique for BP measurements

1. Use a BP measurement device that has been validated.
2. Support the patient's arm (eg, resting on a desk).
3. Position the middle of the cuff on the patient's upper arm at the level of the right atrium (the midpoint of the sternum).
4. Use the correct cuff size, such that the bladder encircles 80% of the arm.
5. Either the stethoscope diaphragm or bell may be used for auscultatory readings.

## Step 3: Take the proper measurements needed for diagnosis and treatment of elevated BP/hypertension

1. At the first visit, record BP in both arms. Use the arm that gives the higher reading for subsequent readings.
2. Separate repeated measurements by 1 to 2 minutes.
3. For auscultatory determinations, use a palpated estimate of radial pulse obliteration pressure to estimate SBP. Inflate the cuff 20 to 30 mmHg above this level for an auscultatory determination of the BP level.
4. For auscultatory readings, deflate the cuff pressure 2 mmHg per second, and listen for Korotkoff sounds.

# Office-based BP measurement

## Step 4: Properly document accurate BP readings

1. Record SBP and DBP. If using the auscultatory technique, record SBP and DBP as onset of the first Korotkoff sound and disappearance of all Korotkoff sounds, respectively, using the nearest even number.
2. Note the time of most recent BP medication taken before measurements.

## Step 5: Average the readings

1. Use an average of  $\geq 2$  readings obtained on  $\geq 2$  occasions to estimate the individual's level of BP.

## Step 6: Provide BP readings to patient

1. Provide patients the SBP/DBP readings both verbally and in writing.

# Definitions: office- based

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Normal BP: Systolic <120 mmHg and diastolic <80 mmHg

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Elevated BP: Systolic 120 to 129 mmHg and diastolic <80 mmHg

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Hypertension Stage 1: Systolic 130 to 139 mmHg or diastolic 80 to 89 mmHg

Hypertension Stage 2: Systolic at least 140 mmHg or diastolic at least 90 mmHg

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Isolated SBP: Systolic  $\geq$ 130 mmHg systolic and diastolic <80 mmHg diastolic

Isolated DBP: Systolic <130 mmHg systolic and diastolic  $\geq$ 80mmHg diastolic

# Definitions: ABPM

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A 24-hour mean of  $\geq 125$  mmHg systolic or  $\geq 75$  mmHg diastolic

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Daytime (awake) mean of  $\geq 130$  mmHg systolic or  $\geq 80$  mmHg diastolic

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Nighttime (asleep) mean of  $\geq 110$  mmHg systolic or  $\geq 65$  mmHg diastolic

# White coat & masked hypertension

## White coat

- Consistently elevated by office readings but does not meet diagnostic criteria for hypertension based upon out-of-office readings.

## Masked

- Consistently elevated by out-of-office measurements but does not meet the criteria for hypertension based upon office readings.



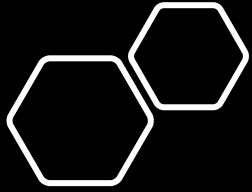
# Classification

Primary  
(essential)

Secondary

# Primary hypertension

- Blood pressure (BP) = Cardiac output (CO) x Systemic vascular resistance (SVR).
- Blood pressure reacts to changes in the environment to maintain organ perfusion over a wide variety of conditions. The primary factors determining the blood pressure are the sympathetic nervous system, the renin-angiotensin-aldosterone system, and the plasma volume (largely mediated by the kidneys).



# Risk factor for primary hypertension

Age

Obesity

Family history

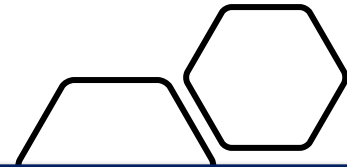
Race/black

High sodium diet >3g

Excessive alcohol

Physical inactivity

# Secondary hypertension



Drugs: Oral contraceptives, NSAIDs, Antidepressants, glucocorticoids and mineralocorticoids, Decongestants, Some weight-loss medications, Sodium-containing antacids, Erythropoietin, Illicit drug, ...

Primary aldosteronism

Other endocrine: hypothyroidism, hyperthyroidism, hyperparathyroidism

Primary kidney disease

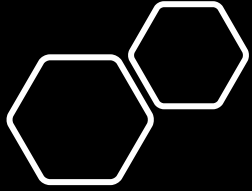
Obstructive sleep apnea

Renovascular

pheochromocytoma

Cushing's syndrome

Coarctation of aorta



# Complications of hypertension

Lt ventricular hypertrophy

Heart failure

Ischemic stroke

Intracerebral hemorrhage

Ischemic heart disease

Chronic kidney disease

# Evaluation: History/examination/investigations

- The extent of target-organ damage, if any
- The presence of established cardiovascular or kidney disease
- The presence or absence of other cardiovascular risk factors.
- Lifestyle factors that could potentially contribute to hypertension
- Potential interfering substances

# Treatment: non-pharmacological approach

## Weight loss

- Best goal is ideal body weight but aim for at least a 1 kg reduction in body weight for most adults who are overweight.

## Healthy diet

- Consume a diet rich in fruits, vegetables, whole grains, and low-fat dairy products, with reduced content of saturated and total fat.

## Reduced intake of dietary sodium

- Optimal goal is <1500 mg/day,

## Enhanced intake of dietary potassium

- consumption of a diet rich in potassium.

## Physical activity

- 90 to 150 minutes/week.

## Moderation in alcohol intake

- Men:  $\leq 2$  drinks daily.
- Women:  $\leq 1$  drink daily.

# Treatment: pharmacological approach

Who should be treated?

Out-of-office daytime blood pressure  $\geq 135$  mmHg systolic or  $\geq 85$  mmHg diastolic.

Or an average office blood pressure  $\geq 140$  mmHg systolic or  $\geq 90$  mmHg diastolic.



# Commonest classes of antihypertensive drugs

## Thiazide-type diuretics

- Hydrochlorothiazide
- Indapamide
- chlorthalidone

## Long-acting calcium channel blockers

- Amlodipine
- Nifedipine
- Diltiazem

## Angiotensin-converting enzyme (ACE) inhibitors

- Lisinopril
- Perindopril
- Ramipril

## Angiotensin II receptor blockers (ARBs)

- Valsartan
- Losartan
- Candesartan

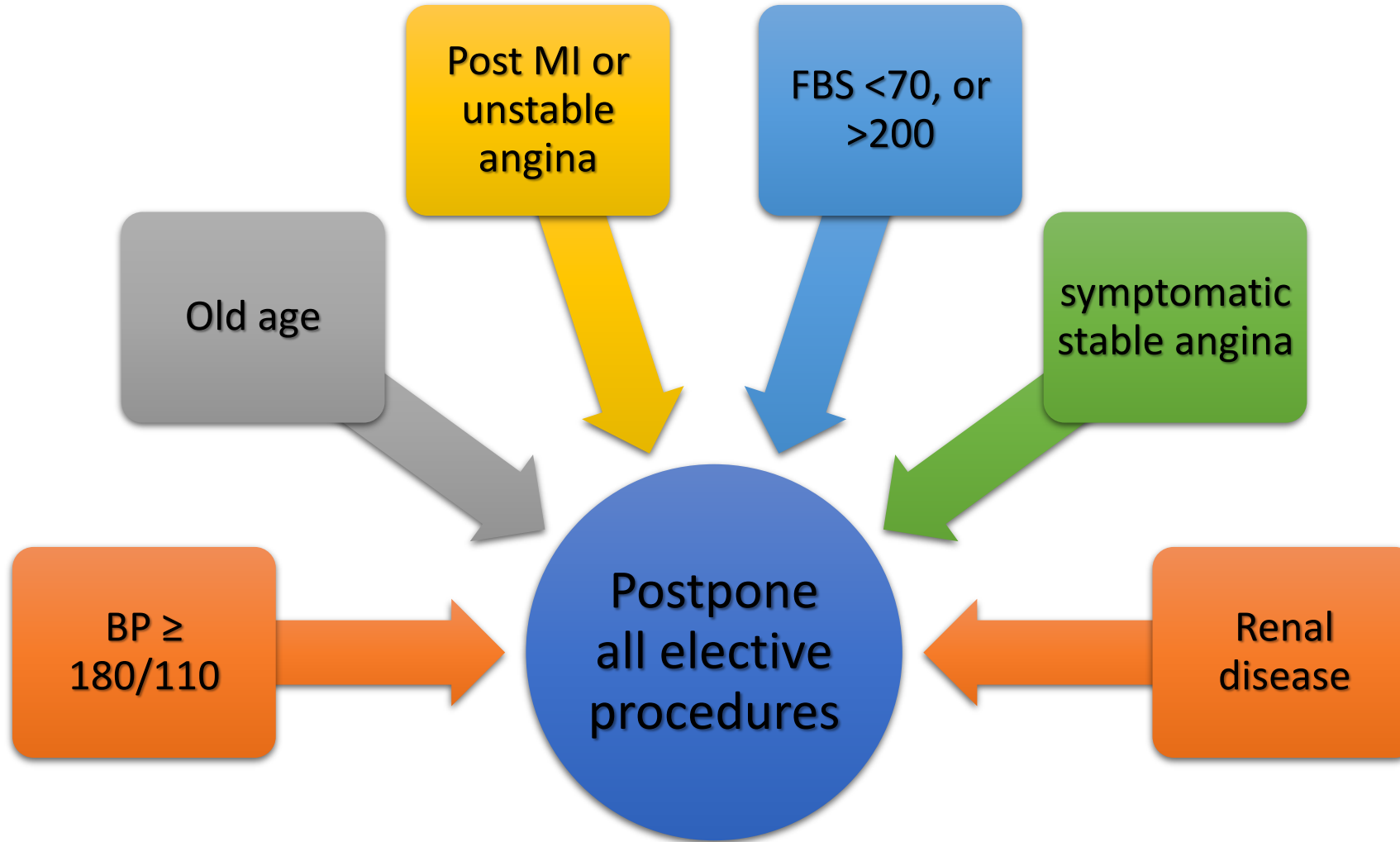
# BP goals

<130 mmHg systolic and <80 mmHg diastolic using out-of-office measurements

<135 mmHg systolic and <85 mmHg diastolic (out-of-office measurement) or <140 mmHg systolic and <90 mmHg diastolic (office measurement)

- Patients with labile blood pressure or postural hypotension
- Patients with side effects to multiple antihypertensive medications
- Patients 75 years or older

# Dental management of patient



- Consult physician or endocrinologist
- Provide only ER care.
- Preparation: monitoring
  - ✓ ECG
  - ✓ BP
  - ✓ HR
  - ✓ respiration monitoring



Thanks