BP Guideline in 2020

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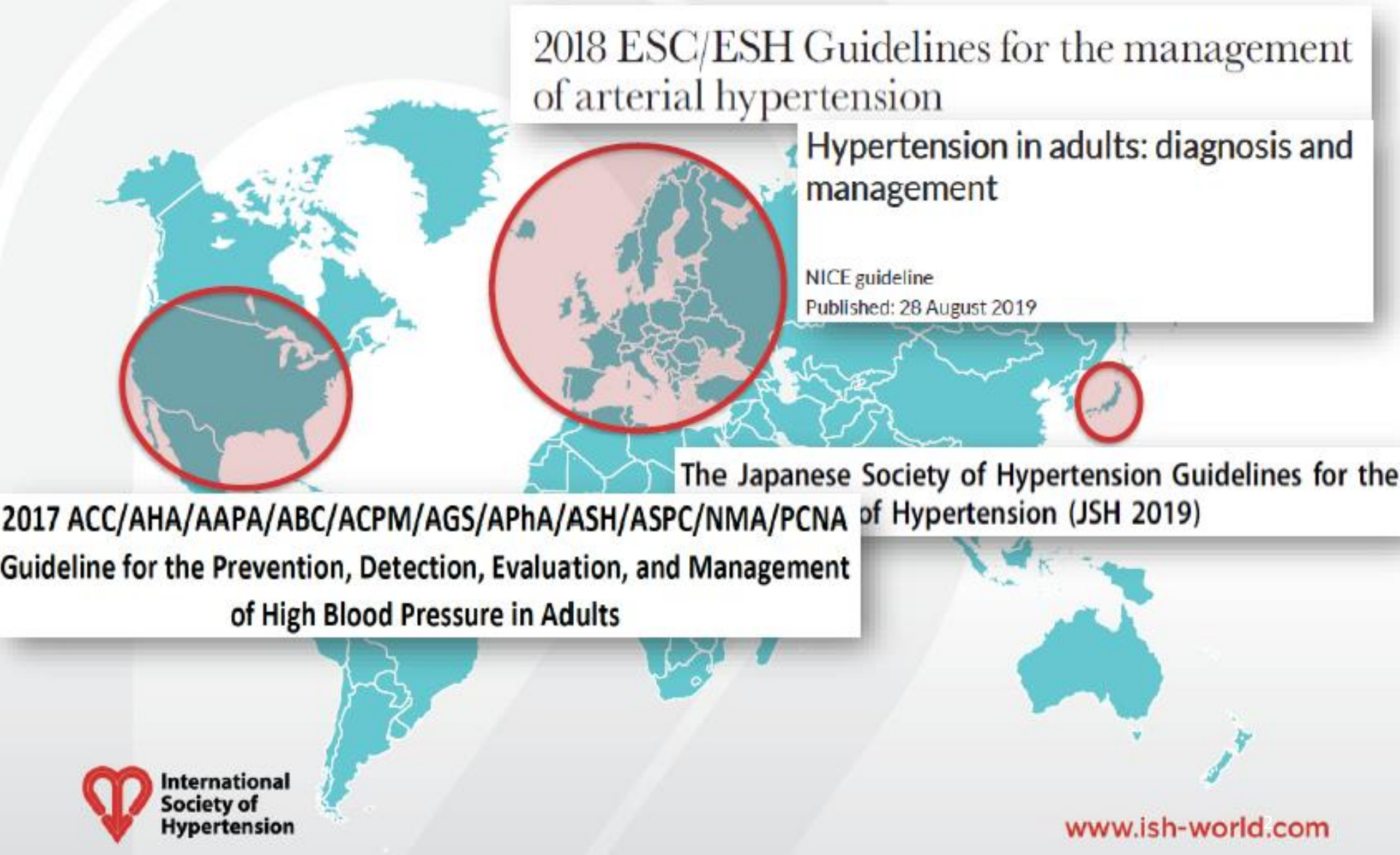
Introduction



2018 ESC/ESH Guidelines for the management of arterial hypertension

Hypertension in adults: diagnosis and management

NICE guideline

Published: 28 August 2019

The Japanese Society of Hypertension Guidelines for the
of Hypertension (JSH 2019)

2017 ACC/AHA/AAPA/ABC/ACPM/AGS/APhA/ASH/ASPC/NMA/PCNA Guideline for the Prevention, Detection, Evaluation, and Management of High Blood Pressure in Adults

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Worldwide trends in blood pressure from 1975 to 2015: a pooled analysis of 1479 population-based measurement studies with 19·1 million participants

*NCD Risk Factor Collaboration (NCD-RisC)**

Summary

Background Raised blood pressure is an important risk factor for cardiovascular diseases and chronic kidney disease. We estimated worldwide trends in mean systolic and mean diastolic blood pressure, and the prevalence of, and number of people with, raised blood pressure, defined as systolic blood pressure of 140 mm Hg or higher or diastolic blood pressure of 90 mm Hg or higher.

Methods For this analysis, we pooled national, subnational, or community population-based studies that had measured blood pressure in adults aged 18 years and older. We used a Bayesian hierarchical model to estimate trends from 1975 to 2015 in mean systolic and mean diastolic blood pressure, and the prevalence of raised blood pressure for 200 countries. We calculated the contributions of changes in prevalence versus population growth and ageing to the increase in the number of adults with raised blood pressure.

Findings We pooled 1479 studies that had measured the blood pressures of 19·1 million adults. Global age-standardised mean systolic blood pressure in 2015 was 127·0 mm Hg (95% credible interval 125·7–128·3) in men and 122·3 mm Hg (121·0–123·6) in women; age-standardised mean diastolic blood pressure was 78·7 mm Hg (77·9–79·5) for men and 76·7 mm Hg (75·9–77·6) for women. Global age-standardised prevalence of raised blood pressure was 24·1% (21·4–27·1) in men and 20·1% (17·8–22·5) in women in 2015. Mean systolic and mean diastolic blood pressure

Lancet 2017; 389: 37–55

Published Online November 15, 2016 http://dx.doi.org/10.1016/S0140-6736(16)31919-5

This online publication has been corrected. The corrected version first appeared at thelancet.com on September 24, 2020

See Comment page 3

*NCD Risk Factor Collaboration members are listed at the end of the paper

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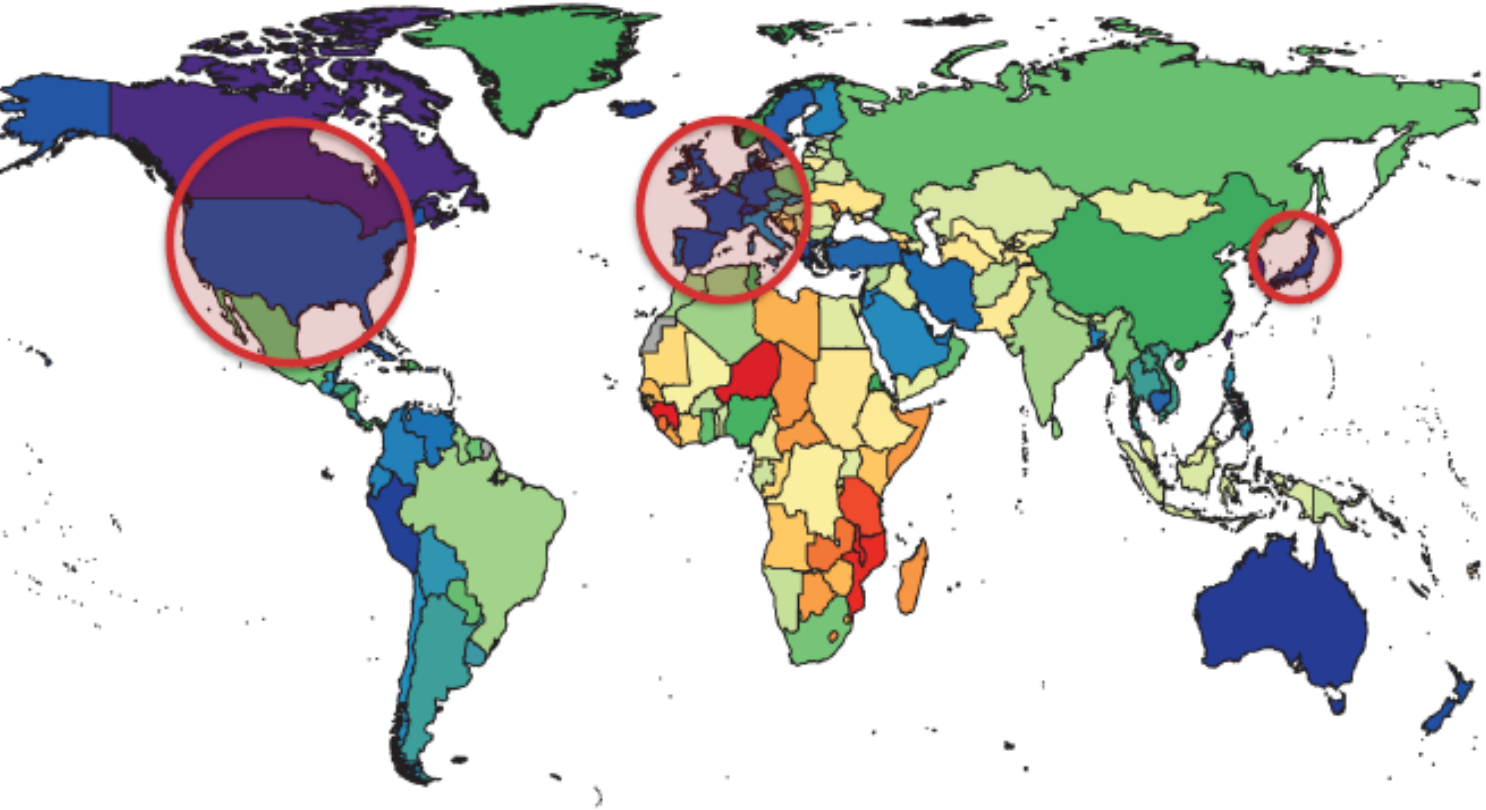
Introduction



Lancet 2017; 389: 37–55

Age-standardised mean systolic blood pressure (mm Hg)

140
135
130
125
120
115
110

- 1.39 billion estimated with hypertension in 2010
- **349** million from HIC
- **1.04 billion** from LMIC

Circulation. 2016;134:441–450

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Introduction

The ***ISH 2020 Global Hypertension Practice Guidelines*** were thus developed based on evidence criteria,

a) to be used globally
b) to be fit for application in low-resource and high-resource settings by advising on ESSENTIAL and OPTIMAL standards of care; and
c) to be concise, simplified and easy to use by clinicians, nurses and community health workers, as appropriate.

Case

خانم ۴۶ ساله متاهل جهت چکاب مراجعه کرده سابقه بیماری خاصی در گذشته نم ی دهد در طَی دو سال اخیر BP در منزل حدودmmHg ۱۳۵/۸۵ است سابقه HTN در پدر دارد کارمند بانک است ۲ دختر دانشجو دارد

PE: RR: 16/min, BP:140/85 mmHg , PR: 74/min, T: 36 C , BMI: 28

در معاینه نکته خاصی ندارد. HBPMیک ماه قبل:

Day time average: 130/90

Night time average: 125/80

24 hs average: 130/85

سوال ۱

در مورد تشخیص بیمار کدام مورد صحیح است؟

A. مبتلا به HTN است

B. جهت تشخیص قطعی نیاز به کنترل مجدد BP در مطب است

C. جهت تشخیص قطعی نیاز به HBPM است

D. جهت تشخیص قطعی نیاز به تکرار ABPM است

Definition of Hypertension

ESSENTIAL

Classification of hypertension based on Office blood pressure (BP) measurement

Category	Systolic (mmHg)		Diastolic (mmHg)
Normal BP	< 130	and	< 85
High-normal BP	130–139	and/or	85–89
Grade 1 Hypertension	140–159	and/or	90–99
Grade 2 Hypertension	≥ 160	and/or	≥ 100

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ISH vs ACC/AHA Guidelines

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	Systolic (mmHg)		Diastolic (mmHg)
Normal BP	<130	and	<85
High-normal BP	130-139	and/or	85-89
Grade 1 Hypertension	140-159	and/or	90-99
Grade 2 Hypertension	≥160	and/or	≥100

American Heart Association. AMERICAN COLLEGE of CARDIOLOGY

	SBP		DBP
Normal	<120 mm Hg	and	<80 mm Hg
Elevated	120–129 mm Hg	and	<80 mm Hg
Hypertension			
Stage 1	130–139 mm Hg	*or*	80–89 mm Hg
Stage 2	≥140 mm Hg	*or*	≥90 mm Hg

Definition of Hypertension

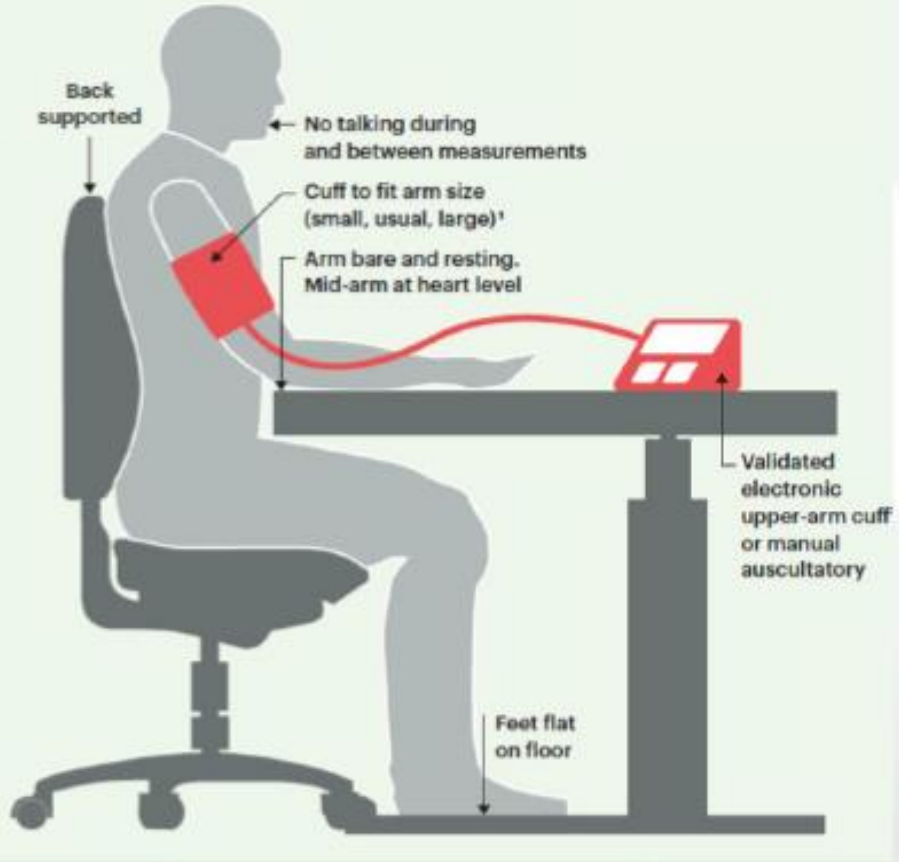
ESSENTIAL

Hypertension based on Office-, Ambulatory (ABPM)- and Home Blood Pressure (HBPM) measurement

		SBP / DBP (mmHg)
Office BP		≥ 140 and/or ≥ 90
ABPM	24h average	≥ 130 and/or ≥ 80
	Day Time (or awake) average	≥ 135 and/or ≥ 85
	Night Time (or asleep) average	≥ 120 and/or ≥ 70
HBPM		≥ 135 and/or ≥ 85

Blood Pressure Measurement and Diagnosis of Hypertension

ESSENTIAL



Office Blood Pressure Measurement

- 2-3 office visits at 1-4-week intervals.
- Whenever possible, the diagnosis should not be made on a single visit (unless BP ≥180/110 mmHg and CVD).
- If possible and available the diagnosis of hypertension should be confirmed by out-of-office measurement.

Blood Pressure Measurement and Diagnosis of Hypertension

ESSENTIAL

OFFICE BP MEASUREMENT

Conditions	Device	Protocol
Position	**Cuff**	**Interpretation**
• Setting • Body position • Talking	• Validated electronic upper-arm cuff (www.stridebp.org) • Alternatively manual auscultatory device • Cuff size	• Average 2nd-3rd measurement • 2-3 office visits required

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STRIDE BP is an international scientific non-profit organization founded by hypertension experts with the mission of improving the diagnosis and management of hypertension.

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ONLY 8% OF BLOOD PRESSURE DEVICES ON THE MARKET APPROVED BY THE STRIDE BP

STRIDE BP has approved **310** and recommends as preferred only **170** of the over **4,000** electronic blood pressure monitors currently available on the market

stridebp.org/bp-monitors

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Ambulatory

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Children

Download

Pregnancy

Download

VALIDATED DEVICES FOR OFFICE / CLINIC BP MEASUREMENT

Preferred devices (35)

A&D UM-101
A&D UM-211
Accoson Greenlight 300
Andon iHealth BP3
Andon iHealth Clear BPM1 *
Andon iHealth Ease BP3L *
Andon iHealth Neo BP5S *
Andon iHealth Track KN-550BT *
Andon KD-558BR *
Andon KD-5920 *
Andon KD-5923 *
Andon KD-5965
Artsana Pic Indolor Professional
Dinamap ProCare 400
Erkameter 125 PRO
InBody BPBIO250
InBody HBP570 *
Microlife 3AS1-2
Microlife VSA (BP3GP1-1L) *
Microlife WatchBP Office
Microlife WatchBP Office (BP3SK1-3B) *
Microlife WatchBP Office ABI
Microlife WatchBP Office AFIB *
Microlife WatchBP Office Central *
Nissei DM3000
Omron HBP T105
Omron HBP-1300
Omron HBP-1320
Omron HBP-9030 *
Omron M3500
Raycome RBP-1200
RisingSun RS-651
Rossmax AC1000f
Suntech CT40
Welch Allyn ProBP 2000

Validated devices (10)

1. Andon iHealth View BP7S
2. Omron HEM-907
3. Andon KD-723
4. Rossmax Mandaus II
5. BpTRU BPM-100
6. Spengler Pro M
7. Dinamap ProCare
8. Suntech 247
9. Mindray Datascope Accutorr Plus
10. Welch Allyn Vital Signs

Blood Pressure Measurement and Diagnosis of Hypertension

ESSENTIAL

BP Measurement Plan according to Office BP levels

Office blood pressure levels (mmHg)		
<130/85	130-159/85-99	>160/100
• Remeasure within 3 years (1 year if other risk factors).	• If possible confirm with out-of-office measurement. • Alternatively confirm with repeated office visits.	• Confirm within a few days/weeks.

Blood Pressure Measurement and Diagnosis of Hypertension

OPTIMAL

Office Blood Pressure

Initial evaluation

- Measure BP in both arms. Difference >10 mmHg: use arm with higher BP; >20 mmHg: consider further investigation.

Standing BP

- In treated patients when symptoms of postural hypotension.
- At first visit in elderly and diabetics.

Unattended BP

- More standardized. Lower BP levels with uncertain threshold.
- Out-of-office BP again needed in most cases

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سوال ۲

در مورد تعریف Unattended BP کدام مورد صحیح است؟

A. کنترل فشارخون در مطب بدون حضور همراه

B. کنترل فشارخون بطور اتوماتیک در مطب بدون حضور هر فردی در اتاق

C. کنترل فشارخون بطور اتوماتیک در مطب توسط پرستار ماهر در حضور همراه

D. کنترل فشارخون در منزل و اطلاع آن بوسیله همراه بدون حضور بیمار

Automated OBP (AOBP) technique or Unattended BP

- **Methodology adopted in SPRINT (SBP Intervention Trial), used a fully automated oscillometric device with the patient sitting alone in the examination room for 5 minutes, after which 3 readings were taken automatically at 1-minute intervals with all 3 values averaged.**

Automated OBP (AOBP) technique or Unattended BP

- **Human involvement was reduced to the minimum, eliminating the "white coat effect," & AOBP readings correlated more closely with those of ABPM than conventional office recordings.**

Blood Pressure Measurement and Diagnosis of Hypertension

OPTIMAL

Clinical Use of Home and Ambulatory BP Monitoring

Conditions	Device	Protocol
Position	Cuff	Interpretation

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Blood Pressure Measurement and Diagnosis of Hypertension

OPTIMAL

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	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	**Before each visit to the health professional:** • 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. **Long-term follow-up of treated hypertension:** • 1–2 measurements per week or month.	• 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	• Average home blood pressure after excluding readings of the first day ≥ 135 or 85 mmHg indicates hypertension.	• 24-hour ambulatory blood pressure ≥ 130/80 mmHg indicates hypertension (primary criterion). • Daytime (awake) ambulatory blood pressure ≥ 135/85 mmHg and nighttime (asleep) ≥ 120/70 mmHg indicates hypertension

Blood Pressure Measurement and Diagnosis of Hypertension

OPTIMAL

White-coat Hypertension

- Intermediate CV risk.
- If low total CV risk and no organ damage, drug treatment may not be prescribed.
- Follow with lifestyle changes.

Masked Hypertension

- Similar CV risk as sustained hypertensives.
- Drug treatment may be required aiming to normalise out-of-office BP.

Diagnostic and Clinical Tests

ESSENTIAL

- **Medical History** (BP, risk factors, co-morbidities, signs/symptoms of secondary hypertension…)
- **Physical Examination** (circulation, heart, other systems)
- **Lab Investigations** (Na^+, K^+, creatinine, eGFR, dipstick lipids, Fasting Glucose where available)
- **12 lead ECG** (AF, LV hypertrophy, IHD…)

OPTIMAL

- **Additional tests to consider** (extended biochemistry, cardiac/kidney/brain/vascular imaging, fundoscopy…)

Cardiovascular Risk Factors

- **More than 50% of hypertensive patients have additional CV risk factors**
- **Most commonly:** Met Syn, T2DM, lipid disorders, ↑ uric acid
- **CV risk assessment is important and should be assessed in all hypertensive patients**
- **Consider increased risk with:** chronic inflammatory disease, COPD, psychiatric disorders, psycho-social stressors

Cardiovascular Risk Factors

Other risk factors, HMOD, or disease	High-normal SBP 130–139 DBP 85–89	Grade 1 SBP 140–159 DBP 90–99	Grade 2 SBP ≥160 DBP ≥100
No other risk factors	Low	Low	Moderate -- High
1 or 2 risk factors	Low	Moderate	High
≥3 risk factors	Low -- Moderate	High	High
HMOD, CKD grade 3, diabetes mellitus, CVD	High	High	High

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Hypertension-mediated Organ Damage

HMOD Assessment

ESSENTIAL

- Serum creatinine
- eGFR
- Dipstick urine test
- 12-lead ECG

OPTIMAL

- Brain
- Eyes
- Heart
- Kidneys
- Arteries

Serial assessment of HMOD
may help to determine efficacy of treatment

سوال ۳

دراین بیمار چه اقدام درمانی توصیه می کنید؟

A. LSM

B. والزارتان ۸۰ میلیگرم روزانه

C. لوزاتن H روزی ۱ عدد

D. والزومیکس ۵/۸۰ روزی ۱ عدد

E. هیدروکلروتیازید ۱۲/۵ میلیگرم روزانه

Exacerbators & Inducers of Hypertension

Most common medications that can increase BP

- Non-selective or traditional NSAIDs
- Combined oral contraceptive pill
- Select anti depressant medications including tricyclic antidepressants and SNRIs
- Acetaminophen when used almost daily and for prolonged periods

Exacerbators & Inducers of Hypertension

- The effect of Anti-retroviral therapy is unclear as studies demonstrate either no effect on BP or some increase.
- Alcohol raises BP regardless of the type of alcoholic drink.
- Limited evidence on herbal and other substances.
- Ma Huang, Ginseng at high doses and St. John's Wort reported to increased BP.

Non-pharmacological Treatment

- Healthy lifestyle choices can prevent or delay the onset of high BP and can reduce CV risk
- Lifestyle modification is often the first line of antihypertensive treatment.
- Modifications in lifestyle can also enhance the effects of antihypertensive treatment.

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Non-pharmacological Treatment - Diet

- Reducing salt added when preparing foods and at the table. Avoid or limit consumption of high salt foods.
- Eating a diet rich in whole grains, fruits, vegetables, poly-unsaturated fats and dairy products, such as DASH diet.
- Reducing food high in sugar, saturated fat and trans fats.
- Increasing intake of vegetables high in nitrates (leafy vegetables and beetroot). Other beneficial foods and nutrients include those high in magnesium, calcium and potassium (avocados, nuts, seeds, legumes and tofu).


THE DASH DIET
WHAT CAN I EAT?
YES
NO
FRUITS
VEGETABLES
SUGARY PRODUCTS
FULL FAT DAIRY AND CHEESE
WHOLE GRAINS
ENRICHED GRAINS
HEALTHY DAIRY
ELEVATED SODIUM LEVELS
LEAN MEATS
NUTS, SEEDS, AND LEGUMES
ALCOHOL
HEALTHY VEGETABLE-BASED OILS

Non-pharmacological Treatment - Diet

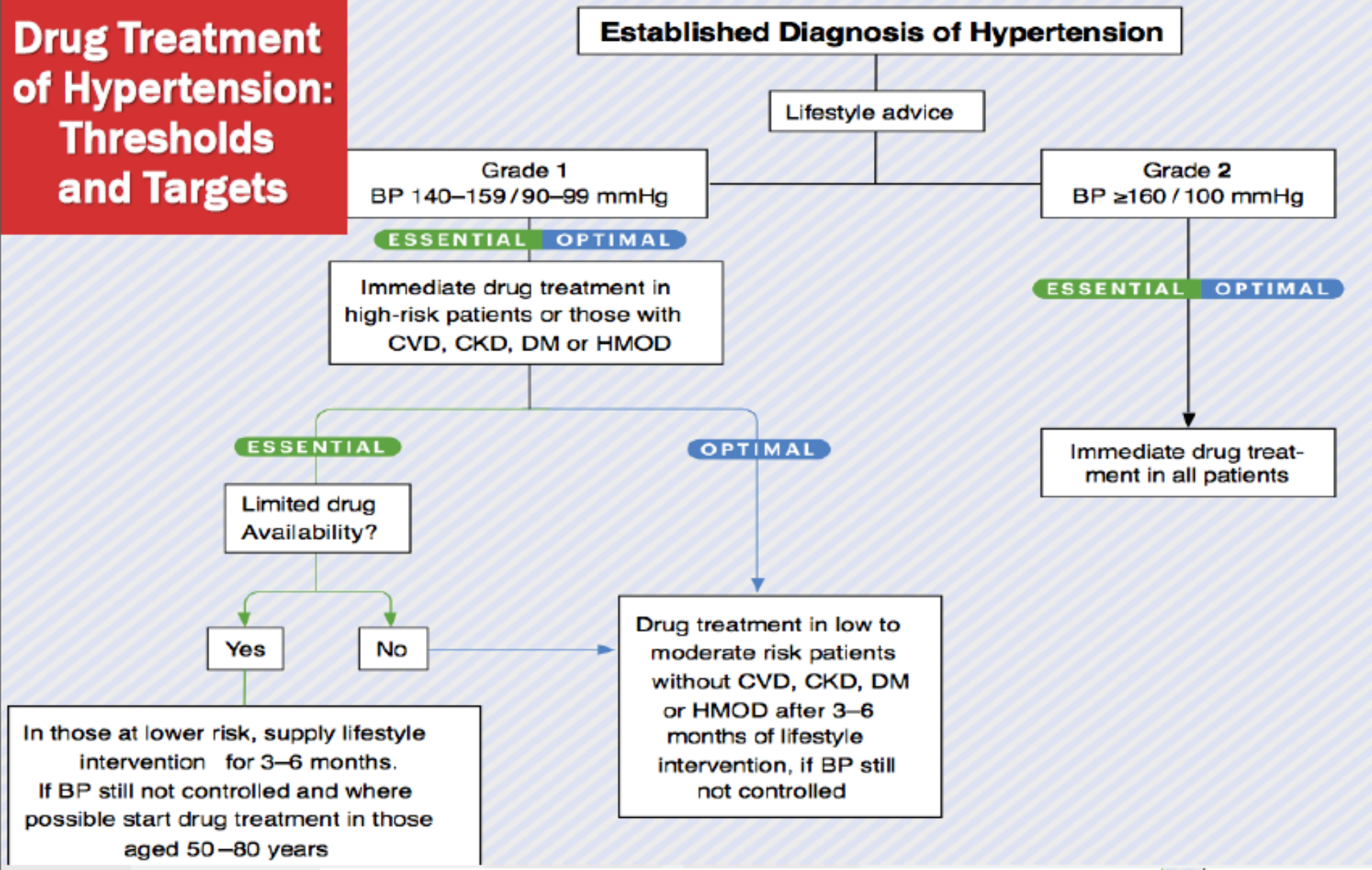
- Moderate consumption of healthy drinks (coffee, green and black tea, Karkadé (Hibiscus) tea, pomegranate juice, beetroot juice and cocoa.

- Moderation of alcohol consumption and avoidance of binge drinking.
- Reduce weight and avoid obesity.
- Be careful with complementary, alternative or traditional medicines – little/no evidence.

Non-pharmacological Treatment - Lifestyle

- Smoking cessation. 
- Engage in regular moderate intensity aerobic and resistance exercise, 30 minutes on 5 – 7 days per week or HIIT (High Intensity Interval Training). 
- Reduce stress and introduce mindfulness. 
- Reduce exposure to air pollution and cold temperature.

Drug Treatment of Hypertension: Thresholds and Targets



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ESSENTIAL Target BP reduction by at least 20/10 mmHg, ideally to <140/90 mmHg

OPTIMAL <65 years : BP target <130 / 80 mmHg if tolerated (but >120 / 70 mmHg).
≥65 years : BP target <140 / 90 mmHg if tolerated but consider an individualised BP target in the context of frailty, independence and likely tolerability of treatment.

Aim for BP control within 3 months

Drug choice & Sequencing

ESSENTIAL

- Use whatever drugs are available with as many of the ideal characteristics (see ***Table 9***) as possible.
- Use free combinations if SPCs are not available or unaffordable
- Use thiazide diuretics if thiazide-like diuretics are not available
- Use alternative to DHP-CCBs if these are not available or not tolerated (i.e. Non-DHP-CCBs: diltiazem or verapamil).

OPTIMAL

Ideally Single Pill Combination Therapy (SPC)

Step 1 Dual low-dose# combination	**A + C** [a, b, c]
Step 2 Dual full-dose combination	**A + C** [a, b]
Step 3 Triple combination	**A + C + D**
Step 4 (Resistant Hypertension) Triple Combination + Spironolactone or other drug*	**A + C +D Add Spironolactone (12.5 – 50 mg o.d.)**[d]

ESSENTIAL and OPTIMAL

Consider beta-blockers at any treatment step when there is a specific indication for their use, e.g. heart failure, angina, post-MI, atrial fibrillation, or younger women with, or planning pregnancy.

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a) Consider monotherapy in low risk grade 1 hypertension or in very old (≥80 yrs) or frailer patients.
b) Consider A + D in post-stroke, very elderly, incipient heart failure or CCB intolerance.
c) Conside[illegible]ts.
d) Caution [illegible]tassium sparing diuretics when estimated GFR <45 ml/min/1.73m² or K⁺ >4.5 mmol/L.

A screenshot of a cell phone

Description automatically generated

A = ACE-Inhibitor or ARB (Angiotensin Receptor Blocker)
C = DHP-CCB (Dihydropyridine -Calcium Channel Blocker)
D = Thiazide-like diuretic

Drug Treatment of Hypertension

Summary 1

In established hypertension, uncontrolled by lifestyle measures:

Drug Treatment Threshold

≥140/90 mmHg (raising to ≥160/100 mmHg for those at lowest risk)

Drug Treatment Target

OPTIMAL

<65 years: <130/80 mmHg

≥65 years: <140/90 mmHg

ESSENTIAL

reduce BP by ≥20/10 mmHg

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Drug Treatment of Hypertension

Summary 2

OPTIMAL

(i) Uptitration to target, of the following:
Low dose A+C → Full dose A+C → A+C+D → A+C+D + spironolactone

(ii) Consider other initial combinations for specific patient subgroups

(iii) Use SPC's where possible

(iv) Use thiazide-like diuretics preferentially

ESSENTIAL

- Where less ideal agents are available, focus on effective BP lowering (≥20/10 mmHg)

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سوال ۴

دراین بیمار قواصل ویزیت چند ماه یک بار است؟

A. ۱

B. ۲

C. ۳

D. ۶

سوال ۵

دراین بیمار بعد از کنترل BP فواصل ویزیت چند ماه یک بار می شود؟

A. ۱-۳

B. ۳-۶

C. ۶-۱۲

D. بسته به سن بیمار و نوع دارو فواصل ویزیت تغییر می کند

Comorbidities of Hypertension

- Well established **common comorbidities** include CAD, stroke, CKD, Heart failure, COPD and HIV/AIDS.
- Emerging **uncommon comorbidities** include rheumatic/inflammatory diseases and psychiatric diseases.
- Uncommon comorbidities are largely underestimated by guidelines and often treated with self-prescribed drugs frequently interfering with BP control.

Comorbidities of Hypertension

In patients with **common comorbidities** the therapeutic strategy depends on CV risk profile and includes:

- **Lifestyle changes (diet, exercise, body weight, smoking).**
- **BP control to target.**
- **Effective treatment of CV risk factors (LDL-C, Fasting Glucose, SUA).**
- **Antiplatelet therapy in patients with CVD.**

Comorbidities of Hypertension

Additional co-morbidity	Recommended Drugs	Warning
Rheumatic disorders	• RAS-inhibitors and CCBs ± Diuretics • Biologic drugs not affecting blood pressure should be preferred (where available)	High doses of NSAID's
Psychiatric disorders	• RAS-inhibitors and diuretics • Beta-blockers (not metoprolol) if drug-induced tachycardia (antidepressant, antipsychotic drugs). • Lipid-lowering drugs/Antidiabetic drugs according to risk profile	Avoid CCBs if orthostatic hypotension (SRI's)

Resistant Hypertension

- Suspect resistant hypertension if office BP >140/90 mmHg on treatment with at least 3 antihypertensives (in maximal or maximally tolerated doses) including a diuretic.
- Exclude pseudo-resistant hypertension (white-coat effect, non-adherence to treatment, incorrect BP measurements, errors in antihypertensive therapy) and substance-induced hypertension as contributors.
- Optimise health behaviours and lifestyle.

Resistant Hypertension

- Consider changes in the diuretic-based treatment prior to adding the fourth antihypertensive medication.
- Add a low dose of spironolactone (if serum potassium is <4.5 mmol/L and eGFR is >45 ml/min/1.73 m^2).
- Consider amiloride, doxazosin, eplerenone, clonidine and beta-blockers as alternatives to spironolactone. If unavailable, consider any antihypertensive class not already in use.
- Optimally, consider referring to a specialist centre with sufficient expertise/resources.

Secondary Hypertension

ESSENTIAL

Basic screening for secondary hypertension

thorough history + physical examination (clinical clues) + basic blood biochemistry (including serum sodium, potassium, eGFR, TSH) + dipstick urine analysis.

OPTIMAL

Arrange other investigations for secondary hypertension (additional biochemistry/imaging/others) based on information from history, physical examination and basic clinical investigations and/or if feasible refer to a specialist centre

Hypertensive Emergencies

Management

- Requires immediate BP lowering to prevent or limit further HMOD
- Sparse evidence to guiding management – recommendations largely consensus based.
- Time to lower BP and magnitude of BP reduction depends on clinical context.
- IV Labetalol and nicardipine generally safe to use in all hypertensive emergencies

Hypertensive Emergencies

Clinical presentation	Timeline and target BP	1st line treatment	Alternative
Malignant hypertension with or without TMA or acute renal failure	Several hours, MAP – 20 % to – 25 %	Labetalol Nicardipine	Nitroprusside Urapidil
Hypertensive encephalopathy	Immediate, MAP – 20 % to – 25 %	Labetalol Nicardipine	Nitroprusside
Acute ischemic stroke and BP > 220 mmHg systolic or >120 mmHg diastolic	1 h, MAP – 15 %	Labetalol Nicardipine	Nitroprusside
Acute ischemic stroke with indication for thrombolytic therapy and BP > 185 mmHg systolic or > 110 mmHg diastolic	1 h, MAP – 15 %	Labetalol Nicardipine	Nitroprusside
Acute hemorrhagic stroke and systolic BP >180 mmHg	Immediate, systolic 130 < BP < 180 mmHg	Labetalol Nicardipine	Urapidil
Acute coronary event	Immediate, systolic BP < 140 mmHg	Nitroglycerine Labetalol	Urapidil
Acute cardiogenic pulmonary edema	Immediate, systolic BP <140 mmHg	Nitroprusside or Nitroglycerine (with loop diuretic)	Urapidi (with loop diuretic)
Acute aortic disease	Immediate, systolic BP <120 mmHg and heart rate <60 b.p.m.	Esmolol and Nitroprusside or Nitroglycerine or Nicardipine	Labetalol or Metoprolol
Eclampsia and severe pre-eclampsia/HELLP	Immediate, systolic BP < 160 mmHg and diastolic BP < 105 mmHg	Labetalol or Nicardipine and Magnesium sulphate	

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Ethnicity, Race and Hypertension

Populations from ASIA

- ⬆ Morning & nighttime hypertension vs Europeans

EAST ASIAN populations

- ⬆ Likelihood of salt-sensitivity + mild obesity in hypertensive patients
- ⬆ Stroke prevalence (esp. hemorrhagic) & non-ischemic HF vs Western populations

SOUTH ASIAN populations (Indian subcontinent)

- ⬆ Risk for CV & metabolic diseases (CAD & T2DM)

Management of hypertension

SOUTH EAST ASIA: Standard treatment until more evidence becomes available

Hypertension Management at a Glance

ESSENTIAL

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Diagnosis

Single office BP measurement*

- Normal BP level (<130/85 mmHg) → Remeasure after 3 years (1 year in those with other risk factors)
- High-normal BP level (130–139/85–89 mmHg) → Take 2 more readings – use the average of 2nd–3rd
- Hypertension BP level (≥140/90 mmHg) → Take 2 more readings – use the average of 2nd–3rd

≥130/85 mmHg

Remeasure in 2–3 office visits. If possible confirm with home or ambulatory BP monitoring

Repeated office BP ≥140/90 mmHg indicates hypertension, particularly if home BP ≥135/85 mmHg or 24h ambulatory BP ≥130/80 mmHg

* Use a validated upper arm-cuff device with appropriate cuff size for the individual patient.

Evaluation

History & Physical Exam
- Exclude drug-induced hypertension
- Evaluate for organ damage
- Assess total cardiovascular risk
- Search for symptoms/signs of secondary hypertension

Lab Tests
- Serum sodium, potassium & creatinine
- Lipid profile & glucose
- Urine dipstick
- 12 lead ECG

Additional Tests
- If necessary for suspected organ damage or secondary hypertension

Treatment

Grade 1 Hypertension:
140–159/90–99 mmHg
1. Start lifestyle interventions
2. Start drug treatment in:
   - High-risk patients (CVK,CKD, diabetes, organ damage, or aged 50-80 years)
   - All others with persistent BP elevation after 3–6 months of lifestyle intervention

Grade 2 Hypertension:
≥160/100 mmHg
1. Start drug treatment immediately
2. Start lifestyle intervention

Lifestyle Interventions
- Stop smoking
- Regular exercise
- Lose weight
- Salt reduction
- Healthy diet and drinks
- Lower alcohol intake

Drug Therapy Steps

Use any drugs available and include as many of those below as possible. Consider monotherapy in low-risk grade 1 hypertension and in patients aged >80 years or frail. Simplify regimen with once daily dosing and single pill combinations.

Non-Black Patients
1. Low dose ACEI/ARB* + dCCB
2. Increase to full dose
3. Add thiazide/thiazide-like diuretic
4. Add spironolactone or, if not tolerated or contraindicated, amiloride, doxazosin, eplerenone, clonidine or beta-blocker

Black Patients
1. Low dose ARB* + dCCB or dCCB + thiazide/thiazide-like diuretic
2. Increase to full dose
3. Add diuretic or ARB /ACEI
4. Add spironolactone or, if not tolerated or contraindicated, amiloride, doxazosin, eplerenone, clonidine or beta-blocker

* No ACEI/ARB in women with or planning pregnancy

Monitoring

Target
- Reduce BP by at least 20/10 mmHg, ideally to < 140/90 mmHg
- Individualize for elderly based on frailty

Monitor
- BP control (achieve target within 3 months)
- Adverse effects
- Long-term adherence

Referral
- If BP still uncontrolled, or other issue, refer to care provider with hypertension expertise

Hypertension Management at a Glance

OPTIMAL

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Diagnosis

Office BP measurement
(3 readings – use the average of 2nd–3rd)*

- <130/85 mmHg → Remeasure after 3 years (1 year in those with other risk factors)
- ≥130/85 mmHg → Confirm with home or ambulatory BP monitoring
  - Home BP <135/85 mmHg or 24 h ambulatory BP <130/80 mmHg → Remeasure after 1 year
  - Home BP ≥135/85 mmHg or 24 h ambulatory BP ≥130/80 mmHg → Hypertension diagnosis

* Use a validated automated upper arm-cuff device with appropriate cuff size for the individual patient. At first visit measure BP in both arms simultaneously. If consistent difference use the arm with the higher BP.

Evaluation

History & Physical Exam
- Exclude drug-induced hypertension
- Evaluate for organ damage
- Consider additional CV risk factors
- Assess total cardiovascular risk
- Search for symptoms/signs of secondary hypertension
- Check adherence

Lab Tests
- Serum sodium, potassium & creatinine, uric acid
- Lipid profile & glucose
- Urine dipstick
- 12 lead ECG

Additional Tests
- If necessary for suspected organ damage or secondary hypertension

Treatment

Grade 1 Hypertension:
140–159/90–99 mmHg
1. Start lifestyle interventions
2. Start drug treatment:
- ***Immediately:*** In high-risk patients (CVD, CKD, diabetes or organ damage)
- ***After 3–6 months of lifestyle intervention:*** In low-moderate risk patients with persistent BP elevation

Grade 2 Hypertension:
≥160/100 mmHg
1. Start drug treatment immediately
2. Start lifestyle intervention

Lifestyle Interventions
- Stop smoking
- Regular exercise
- Lose weight
- Salt reduction
- Healthy diet and drinks
- Lower alcohol intake
- Lower stress
- Reduce exposure to air pollution

Drug Therapy Steps
Simplify regimen with once daily dosing and single pill combinations.
Consider monotherapy in low-risk grade 1 hypertension and in patients aged >80 years or frail

Non-Black Patients
1. Low dose ACEI/ARB* + dCCB
2. Increase to full dose
3. Add thiazide-like diuretic
4. Add spironolactone or, if not tolerated or contraindicated, amiloride, doxazosin, eplerenone, clonidine or beta-blocker

Black Patients
1. Low dose ARB* + dCCB or dCCB + thiazide-like diuretic
2. Increase to full dose
3. Add diuretic or ACE/ARB
4. Add spironolactone or, if not tolerated or contraindicated, amiloride, doxazosin, eplerenone, clonidine or beta-blocker

* No ACEI/ARB in women with or planning pregnancy

Monitoring

Target
- BP <130/80 mmHg
- Individualise for elderly based on frailty

Monitor
- BP control (achieve target within 3 months)
- Adverse effects
- Long-term adherence

Referral
- If BP still uncontrolled, or other issue, refer to care provider with hypertension expertise

ISH vs ACC/AHA Guidelines

- Blood pressure definitions of normal blood pressure **stages of hypertension are different**.
- Inclusion of **high-normal blood pressure** category.
- Blood pressure value **thresholds for treatment are therefore different** (i.e., treatment initiated at lower blood pressure in ACC/AHA guidelines).
- Adoption of ESSENTIAL vs. OPTIMAL throughout ISH guidelines.

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