

HYPERTENSION MANAGEMENT

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Female patient aged 42 years, she had 3 pregnancies 3 children youngest 8 years old with no previous history of any health problems, she is menstruating and IUD as contraception.

IN THE LAST 2 YEARS due to spells of headache and undue fatigue despite of playing sports twice weekly she was diagnosed as having hypertension; investigation at that time showed normal renal function accepted lipid profile with LDL C 103 mg HDL C 65 mg.

At that time perindopril /amlodipine 5/5mg was prescribed for a BP of 180/115. and assuring healthy diet which was already the case.

SIX months later, still symptoms occur from time to time BP was 160/100 ,LDL C 95 ,mg AMLODIPNIE/ PERINDOPREL INCREASED TO 10/10.
THREE Months again, tachypalpitation , edema LL AND SPORADIC COUGH occurred and still patient co of fatigue.

WHAT TO DO ???

WHAT TO ADD NEXT ??

DO WE NEED FURHTUR INVESTIGATION ???

BP WAS 150/95 , HOLTER SHOWED normal sinus rhythm spells of sinus tachycardia reaching 106 / min , STRESS EXERCISE was negative for induction of ischemia nor arrhythmias . ECHO SHOWED mild LVH, and normal LV systolic function .

NORMAL thyroid function . HB = 13.6 gm. Normal other lab tests including electrolytes negative VMA.

WHAT IS THE NEXT STEPS

1- ADD BB

2- ADD DIURETIC ??

3- CHANGE PREVIOUS MEDICATIONS ??

VALSARTAN 320/25. AND BISPROLOL 5 MG once a day were prescribed .

TWO WEEKS AGAIN; dyspnea & Easy fatigue but edema disappeared BP CAME UP TO 150/100 . RESTING HR =84/min.
Patient symptoms prohibited her from three times a week doing sport.

what to do ???

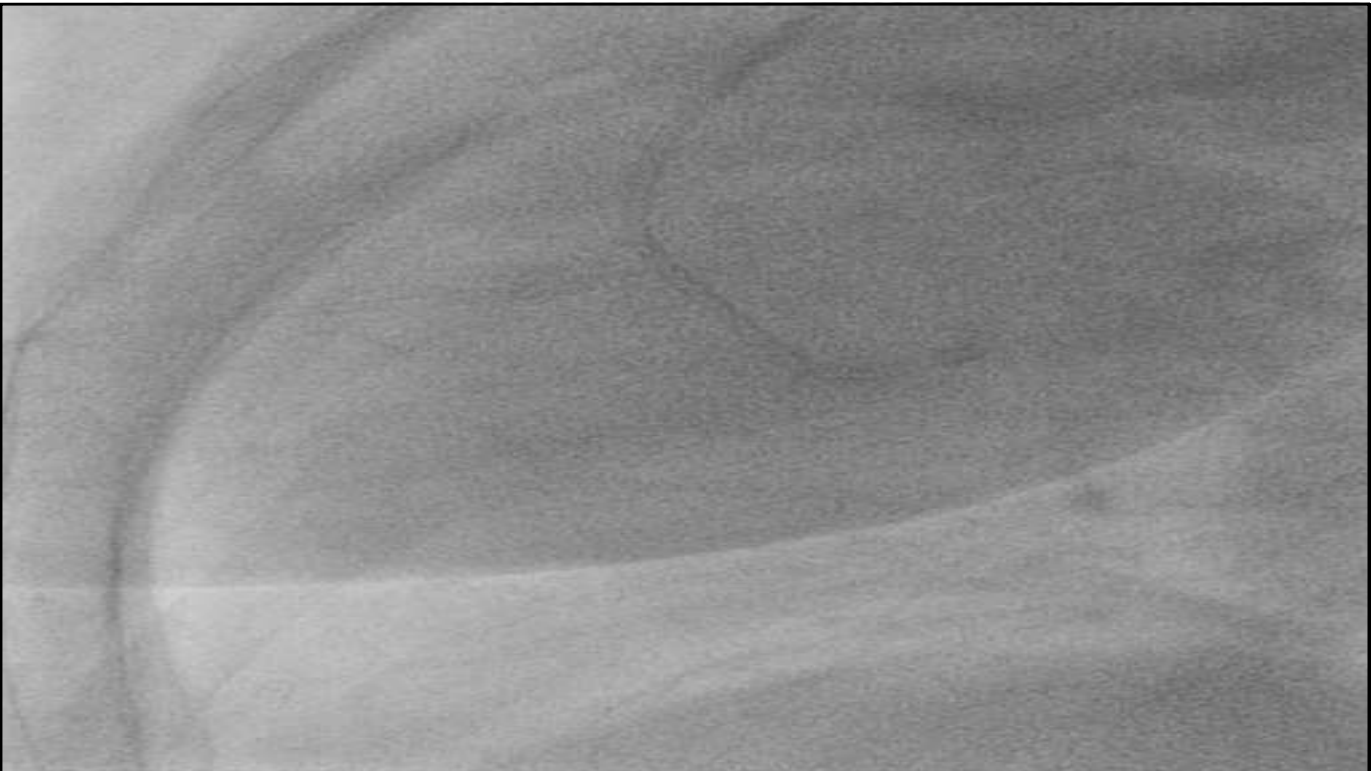
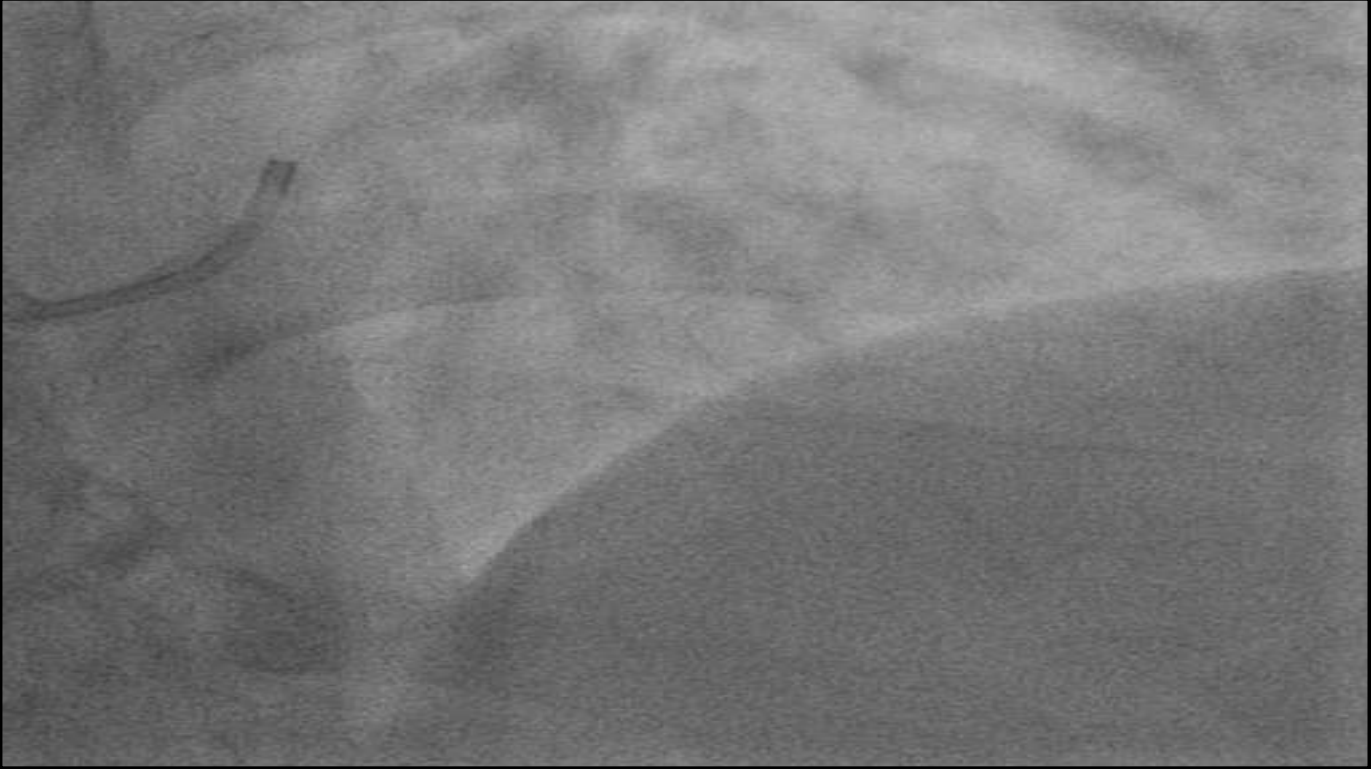
BB WAS REPLACED BY LONG ACTING VERAPAMIL 240 MG.

TWO MONTHS LATER

PROGRESSIVE DYSPNEA. Chest tightness occurred due to stressful condition and 48 hrs later our lady was admitted to ER **WITH BREATHLESSNESS** , pulmonary edema was the case .

ECG SHOWED SINUS TACHYCARDIA HR 124b/min . Poor progression of r in precordial leads .elevated cardiac enzymes.









HOW COULD WE MANAGE NOW ??

2018 ESC-ESH Guidelines for The Management of Arterial Hypertension

Eur Heart J. 2018 Sep 1;39(33):3021-3104. doi: 10.1093/eurheartj/ehy339.

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2013 Vso 2018: What Changed?

2013 Vs 2018: What Changed?

Changes in recommendations	
2013	2018
Diagnosis Office BP is recommended for screening and diagnosis of hypertension.	It is recommended to base the diagnosis of hypertension on: <ul style="list-style-type: none"> Repeated office BP measurements, or ambulatory or home BP monitoring (ABPM and/or HBPM) if logistically and economically feasible.
Treatment thresholds High-normal BP (130–139/85–89 mmHg): Unless the necessary evidence is obtained, it is not recommended to initiate antihypertensive drug therapy at high-normal BP.	Treatment thresholds High-normal BP (130–139/85–89 mmHg): Drug treatment may be considered when CV risk is very high due to established CVD, especially CAD.
Treatment thresholds Treatment of low-risk grade 1 hypertension: Initiation of antihypertensive drug treatment should also be considered in grade 1 hypertensive patients at low–moderate-risk, when BP is within this range at several repeated visits or elevated by ambulatory BP criteria, and remains within this range despite a reasonable period of time with lifestyle measures.	Treatment thresholds Treatment of low-risk grade 1 hypertension: In patients with grade 1 hypertension at low–moderate-risk and without evidence of HF/CKD, BP-lowering drug treatment is recommended if the patient remains hypertensive after a period of lifestyle intervention.

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2013 Vs 2018: What Changed?

Changes in recommendations	
2013	2018
Treatment thresholds Older patients Antihypertensive drug treatment may be considered in the elderly (at least when younger than 80 years) when SBP is in the 140–159 mmHg range, provided that antihypertensive treatment is well tolerated.	Treatment thresholds Older patients BP-lowering drug treatment and lifestyle intervention is recommended in fit older patients (>65 years but not >80 years) when SBP is in the grade 1 range (140–159 mmHg), provided that treatment is well tolerated.
BP treatment targets An SBP goal of <140 mmHg is recommended.	BP treatment targets <ul style="list-style-type: none"> It is recommended that the first objective of treatment should be to lower BP to <140/90 mmHg in all patients and, provided that the treatment is well tolerated, treated BP values should be targeted to 130/80 mmHg or lower in most patients. In patients <65 years it is recommended that SBP should be lowered to a BP range of 120–129 mmHg in most patients.
BP treatment targets in older patients (65–80 years) An SBP target of between 140–150 mmHg is recommended for older patients (65–80 years).	BP treatment targets in older patients (65–80 years) In older patients (≥65 years), it is recommended that SBP should be targeted to a BP range of 130–139 mmHg.

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2013 Vs 2018: What Changed?

Changes in recommendations	
2013	2018
DBP targets	DBP targets
A DBP target of <90 mmHg is always recommended, except in patients with diabetes, in whom values <85 mmHg are recommended.	A DBP target of <80 mmHg should be considered for all hypertensive patients, independent of the level of risk and comorbidities.
Initiation of drug treatment	Initiation of drug treatment
Initiation of antihypertensive therapy with a two-drug combination may be considered in patients with markedly high baseline BP or at high CV risk.	It is recommended to initiate an antihypertensive treatment with a two-drug combination, preferably in a SPC. The exceptions are frail older patients and those at low risk and with grade 1 hypertension (particularly if SBP is <150 mmHg).
Resistant hypertension	Resistant hypertension
Mineralocorticoid receptor antagonists, amiloride, and the alpha-1 blocker doxazosin should be considered if no contraindication exists.	Recommended treatment of resistant hypertension is the addition of low-dose spironolactone to existing treatment, or the addition of further diuretic therapy if intolerant to spironolactone, with either spironone, amiloride, higher-dose thiazide-like diuretic or a loop diuretic, or the addition of bisoprolol or doxazosin.

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Classifications

Table 3 Classification of office blood pressure^a and definitions of hypertension grade^b

Category	Systolic (mmHg)		Diastolic (mmHg)
Optimal	<120	and	<80
Normal	120–129	and/or	80–84
High normal	130–139	and/or	85–89
Grade 1 hypertension	140–159	and/or	90–99
Grade 2 hypertension	160–179	and/or	100–109
Grade 3 hypertension	≥180	and/or	≥110
Isolated systolic hypertension ^c	≥140	and	<90

BP = blood pressure; SBP = systolic blood pressure.
^aBP category is defined according to seated clinic BP and by the highest level of BP, whether systolic or diastolic.
^bIsolated systolic hypertension is graded 1, 2, or 3 according to SBP values in the ranges indicated.
 The same classification is used for all ages from 16 years.

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Lifestyle Interventions for Patients with Hypertension or High-normal BP

Recommendations	Class ^a	Level ^b	Recommendations	Class ^a	Level ^b
Salt restriction to <5 g per day is recommended. ^{246,250,252,258}	I	A	Body-weight control is indicated to avoid obesity (BMI >30 kg/m ² or waist circumference >102 cm in men and >88 cm in women), as is aiming at healthy BMI (about 20–25 kg/m ²) and waist circumference values (<94 cm in men and <80 cm in women) to reduce BP and CV risk. ^{262,271,273,289}	I	A
It is recommended to restrict alcohol consumption to: <ul style="list-style-type: none"> • Less than 14 units per week for men. • Less than 8 units per week for women.²⁵ 	I	A	Regular aerobic exercise (e.g. at least 30 min of moderate dynamic exercise on 5–7 days per week) is recommended. ^{242,278,279}	I	A
It is recommended to avoid binge drinking.	III	C	Smoking cessation, supportive care, and referral to smoking cessation programs are recommended. ^{288,289,291}	I	B
Increased consumption of vegetables, fresh fruits, fish, nuts, and unsaturated fatty acids (olive oil); low consumption of red meat; and consumption of low-fat dairy products are recommended. ^{242,243}	I	A			

BMI = body mass index; BP = blood pressure; CV = cardiovascular.
 Eur Heart J. 2018 Sep 1;39(33):3021-3104. doi: 10.1093/eurheartj/ehy339.

Factors Influencing Cardiovascular Risk in Patients with Hypertension

Asymptomatic HMOD
Arterial stiffening: Pulse pressure (in older people) ≥60 mmHg Carotid-femoral PWV >10 m/s
ECG LVH (Sokolow-Lyon index >35 mm, or R in aVL ≥11 mm; Cornell voltage duration product >2440 mm·ms, or Cornell voltage >28 mm in men or >20 mm in women)
Echocardiographic LVH [LV mass index: men >50 g/m ^{2.7} ; women >47 g/m ^{2.7} (height in m ^{2.7}); indexation for BSA may be used in normal-weight patients; LV mass/BSA g/m ² >115 (men) and >95 (women)]
Microalbuminuria (30–300 mg/24 h), or elevated albumin-creatinine ratio (30–300 mg/g; 3.4–34 mg/mmol) (preferentially on morning spot urine) ⁹
Moderate CKD with eGFR >30–59 mL/min/1.73 m ³ (BSA) or severe CKD eGFR <30 mL/min/1.73 m ³ ¹⁰
Ankle-brachial index <0.9
Advanced retinopathy: haemorrhages or exudates, papilloedema

BSA = body surface area; CAD = coronary artery disease; CKD = chronic kidney disease; CV = cardiovascular; CVD = cardiovascular disease; ECG = electrocardiogram; eGFR = estimated glomerular filtration rate; HDL-C = HDL cholesterol; HFpEF = heart failure with preserved ejection fraction; HMOD = hypertension-mediated organ damage; LV = left ventricular; LVH = left ventricular hypertrophy; PWV = pulse wave velocity; SCORE = Systematic Coronary Risk Evaluation; TIA = transient ischaemic attack.
^aCV risk factors included in the SCORE system.
^bProteinuria and reduced eGFR are independent risk factors.

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ADA 2018

ACC- AHA 2018

BP Thresholds for and Goals of Pharmacologic Therapy in Patients with Hypertension According to Clinical Conditions

Clinical Condition (s)	BP Threshold mm Hg	BP Goal mm Hg
General		
Clinical CVD or 10-year ASCVD risk \geq 10%	\geq 130/80	$<$ 130/80
No clinical CVD and 10-year ASCVD risk $<$ 10%	\geq 140/90	$<$ 130/80
Diets (during \geq 48 hours of lab, non-institutionalized, ambulatory, community-dwelling adults)	\geq 130 (SBP)	$<$ 130 (SBP)
Specific Comorbidities		
Diabetes mellitus	\geq 130/80	$<$ 130/80
Chronic kidney disease	\geq 130/80	$<$ 130/80
Chronic kidney disease post-renal transplantation	\geq 130/80	$<$ 130/80
Heart failure	\geq 130/80	$<$ 130/80
Stable ischemic heart disease	\geq 130/80	$<$ 130/80
Secondary stroke prevention	\geq 140/90	$<$ 130/80
Secondary stroke prevention (ischemic)	\geq 130/80	$<$ 130/80
Peripheral arterial disease	\geq 130/80	$<$ 130/80



ESC – ESH 2018
 $<$ 130/80 mmHg till 65 y
and CKD – more than 65 y target to $<$ 140 /80 mmHg

Age group	Office SBP treatment target ranges (mmHg)					Office DBP treatment target range (mmHg)
	Hypertension	+ Diabetes	+ CKD	+ CAD	+ Stroke/TIA	
18–65 years	Target to 130 or lower (if tolerated) Not $<$120	Target to 130 or lower (if tolerated) Not $<$120	Target to $<$ 140 to 130 (if tolerated)	Target to 130 or lower (if tolerated) Not $<$120	Target to 130 or lower (if tolerated) Not $<$120	70–79
65–79 years ^a	Target to 130–139 (if tolerated)	Target to 130–139 (if tolerated)	Target to 130–139 (if tolerated)	Target to 130–139 (if tolerated)	Target to 130–139 (if tolerated)	70–79
\geq 80 years ^b	Target to 130–139 (if tolerated)	Target to 130–139 (if tolerated)	Target to 130–139 (if tolerated)	Target to 130–139 (if tolerated)	Target to 130–139 (if tolerated)	70–79
Office DBP treatment target range (mmHg)	70–79	70–79	70–79	70–79	70–79	

CHEP 2017

For all : **TARGET $<$ 135/85 mmHg**
DM : TARGET below 130/80 mmHg

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ACC- AHA 2018
Treatment algorithm

COR	LOE	Recommendations
I	SBP: A DBP: C-E	1. Use of BP-lowering medications is recommended for secondary prevention of recurrent CVD events in patients with clinical CVD and an average SBP of 130 mm Hg or higher or an average DBP of 80 mm Hg or higher, and for primary prevention in adults with an estimated 10-year atherosclerotic cardiovascular disease (ASCVD) risk of 10% or higher and an average SBP 130 mm Hg or higher or an average DBP 80 mm Hg or higher (1-9).
I	C-LD	2. Use of BP-lowering medication is recommended for primary prevention of CVD in adults with no history of CVD and with an estimated 10-year ASCVD risk $<$ 10% and an SBP of 140 mm Hg or higher or a DBP of 90 mm Hg or higher (3, 10-13).

BP thresholds and recommendations for treatment and follow-up

Current Age: Sex: Race:

Current Labs/Exam

Total Cholesterol: HDL Cholesterol: LDL Cholesterol: Systolic Blood Pressure:

Personal History

History of Diabetes: On Hypertension Treatment: Smoker:

On a Statin: On Aspirin Therapy:

Stage 1 hypertension (BP 130-139/80-89 mm Hg)

Stage 2 hypertension (BP \geq 140/90 mm Hg)

Clinical ASCVD or estimated 10-y CVD risk \geq 10 %

Nonpharmacological therapy and BP lowering medication (Class I)

No
Nonpharmacological therapy(Class I)

yes
Nonpharmacological therapy and BP lowering medication (Class I)

Reassess in 3–6 mo (Class I)

Reassess in 1 mo (Class I)

No BP goal met yes

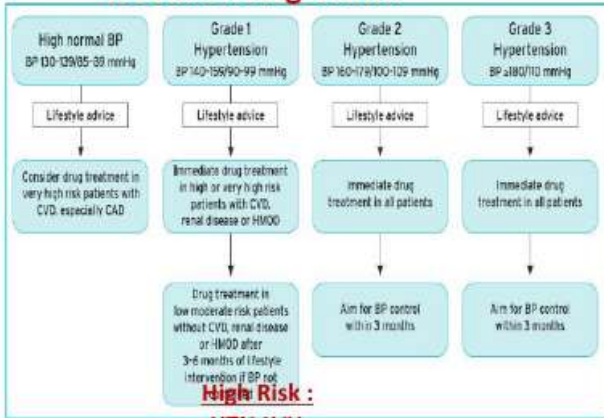
Consider intensification of therapy

Assess and optimize adherence to therapy

Reassess in 3–6 mo (Class I)

Whelton PK et al. 2017 ACC/AHA guideline for the prevention, detection, evaluation and management of high blood pressure in adults. JACC. 2017;10:1016-11.006.

ESC – ESH 2018 Treatment algorithm



High Risk :

- HTN LVH
- HTN Diabetes
- HTN Moderate CKD

Very High Risk:

- HTN with CVD (MI - Stroke – TIA).
- HTN with DM with Target Organ Proteinuria or Grade 3 HTN Hypercholesteremia
- HTN with Severe CKD (GFR less than 30)

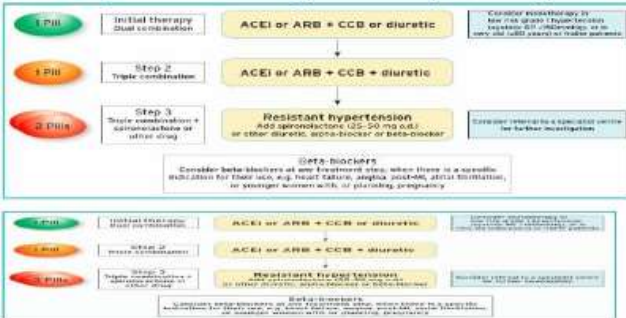
7.5.2.2 Rationale for initial two-drug combination therapy for most patients

As discussed above and with the emphasis in these Guidelines on achieving a BP target in most patients of <130/80 mmHg, the majority of patients will require combination therapy. Initial combination therapy is invariably more effective at BP lowering than monotherapy, indeed even low-dose combination therapy is usually more effective than maximal dose monotherapy.³⁴¹ Furthermore, the combination of medications targeting multiple mechanisms, such as blocking the

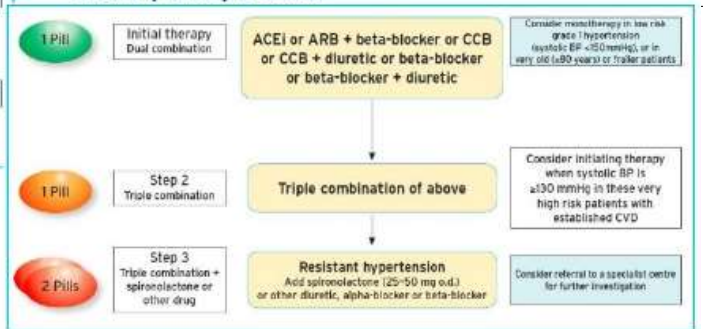
Hypertension disease staging	Other risk factors, HMOD, or disease	BP (mmHg) grading			
		High normal SBP 130-139 DBP 85-89	Grade 1 SBP 140-159 DBP 90-99	Grade 2 SBP 160-179 DBP 100-109	Grade 3 SBP ≥180 or DBP ≥110
Stage 1 (uncomplicated)	No other risk factors	Low risk	Low risk	Moderate risk	High risk
	1 or 2 risk factors	Low risk	Moderate to high risk	Moderate to high risk	High risk
	≥3 risk factors	Low to Moderate risk	Moderate to High risk	High Risk	High risk
Stage 2 (asymptomatic disease)	HMOD, CKD grade 3, or diabetes mellitus without organ damage	Moderate to high risk	High risk	High risk	High to very high risk
Stage 3 (established disease)	Established CVD, CKD grade ≥4, or diabetes mellitus with organ damage	Very high risk	Very high risk	Very high risk	Very high risk

Figure 1 Classification of hypertension stages according to blood pressure levels, presence of cardiovascular risk factors, hypertension-mediated organ damage, or comorbidities. CV risk is illustrated for a middle-aged male. The CV risk does not necessarily correspond to the actual risk at different ages. The use of the SCORE system is recommended for formal estimation of CV risk for treatment decisions. BP = blood pressure; CVD = cardiovascular disease; DBP = diastolic blood pressure; HMOD = hypertension-mediated organ damage; SBP = systolic blood pressure.

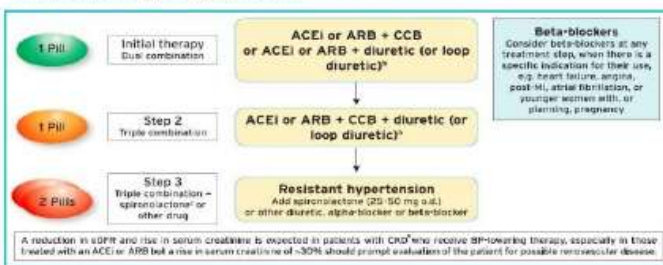
Core drug treatment strategy for uncomplicated hypertension



Drug treatment strategy for hypertension and coronary artery disease.



Drug treatment strategy for hypertension and chronic kidney disease



Diabetes with HTN

It is recommended to initiate treatment with a combination of a RAS blocker with a CCB or thiazide/thiazide-like diuretic.^c 1,175,205

Thank you