SIMA 23
Σι-μα Ιητηρ(ιατρός) Μινωϊκή Κρήτη
1ο ΠΟΛΥΘΕΜΑΤΙΚΟ ΣΥΝΕΔΡΙΟ
ΙΑΤΡΙΚΟΥ ΣΥΛΛΟΓΟΥ ΗΡΑΚΛΕΙΟΥ
ΣΥΝΔΙΟΡΓΑΝΩΣΗ:
ΠΕΡΙΦΕΡΕΙΑ ΚΡΗΤΗΣ
REGION OF CRETE
ΙΝΣΤΙΤΟΥΤΟ ΕΠΙΣΤΗΜΟΝΙΚΩΝ ΕΡΕΥΝΩΝ ΠΙΣ
ΠΕΡΙΦΕΡΕΙΑΚΟ ΤΑΜΕΙΟ ΑΝΑΠΤΥΞΗΣ ΚΡΗΤΗΣ

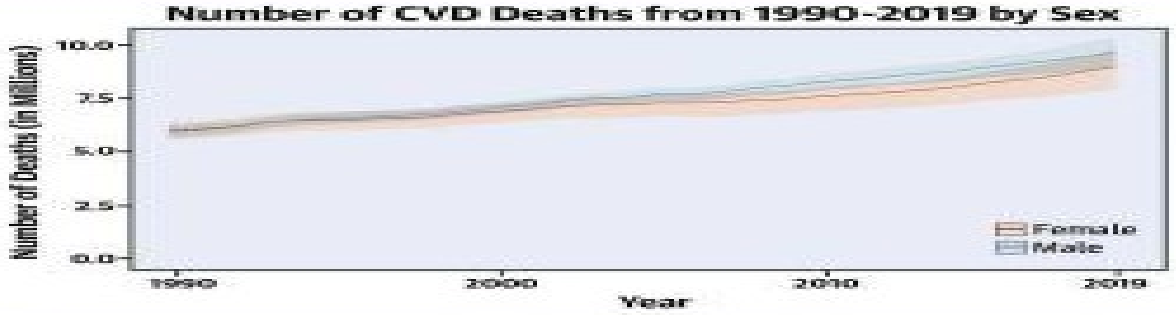
Αρτηριακή υπέρταση στην καρδιακή ανεπάρκεια και τη στεφανιαία νόσο. Διαφέρουν οι στόχοι και οι επιλογές;

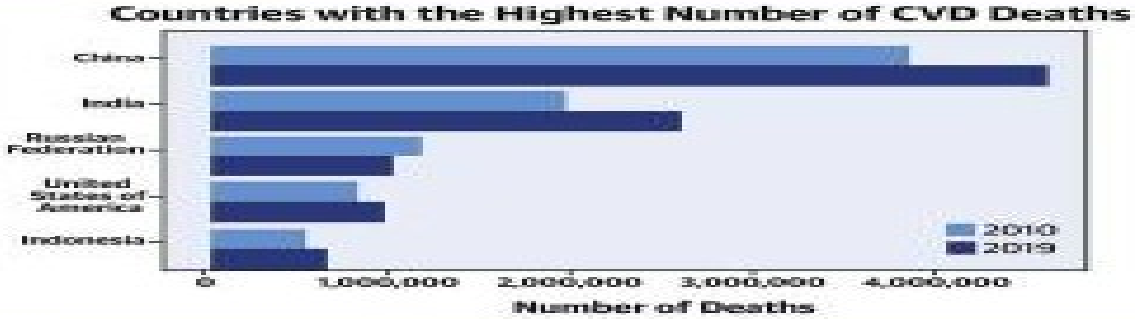
Σπυρίδων Μαραγκουδάκης
Επιμελητής Α Καρδιολογική Κλινική Χανίων

J Am Coll Cardiol. 2020 Dec 22; 76(25): 2982–3021.
doi: 10.1016/j.jacc.2020.11.010

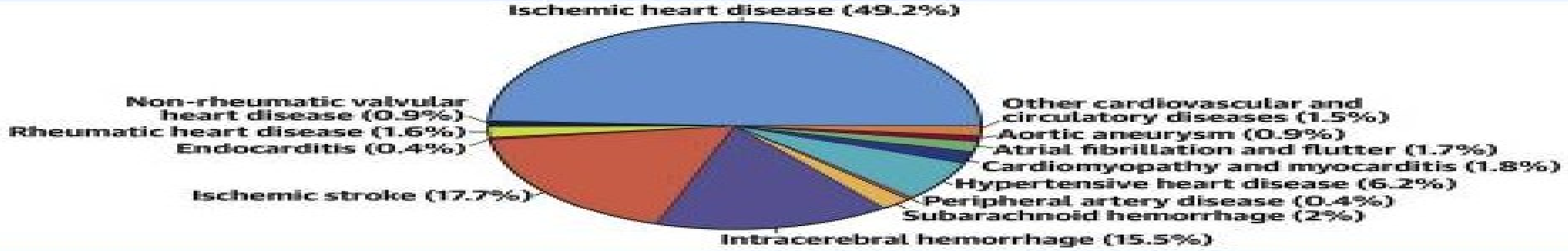
Global Burden of Cardiovascular Diseases and Risk Factors, 1990–2019

Number of CVD Deaths

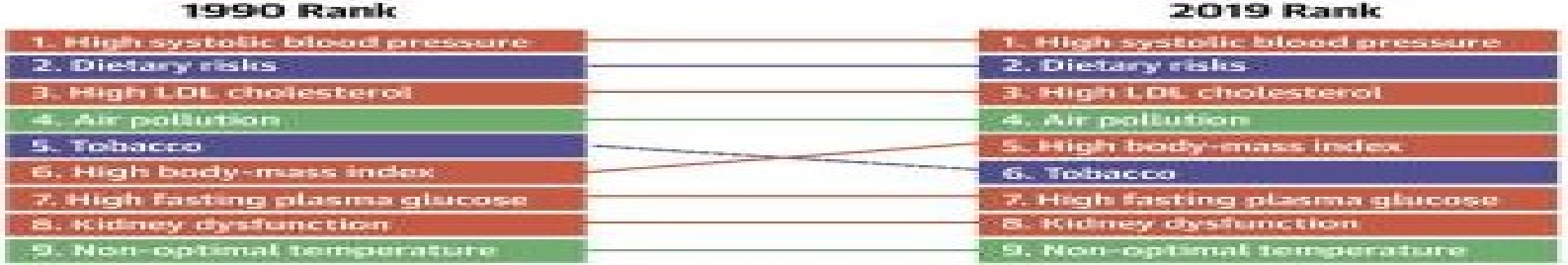




Proportion of CVD Deaths by Cause (2019)



CVD Burden Attributable to Modifiable Risk Factors



J Am Coll Cardiol. 2020 Dec 22; 76(25): 2982–3021.
doi: 10.1016/j.jacc.2020.11.010

Global Burden of Cardiovascular Diseases and Risk Factors, 1990–2019

Ischemic Heart Disease (IHD)

1990 → 2019

The prevalence of IHD in 2019 **increased to 197 million cases** (95% UI: 178-220 million

IHD mortality **increased to 9.14 million** (95% UI: 8.40-9.74 million) in 2019.

ESC
European Society of Cardiology
European Heart Journal (2021) 42, 3227—3337
doi:10.1093/eurheartj/ehab484

2021 ESC Guidelines on cardiovascular disease prevention in clinical practice

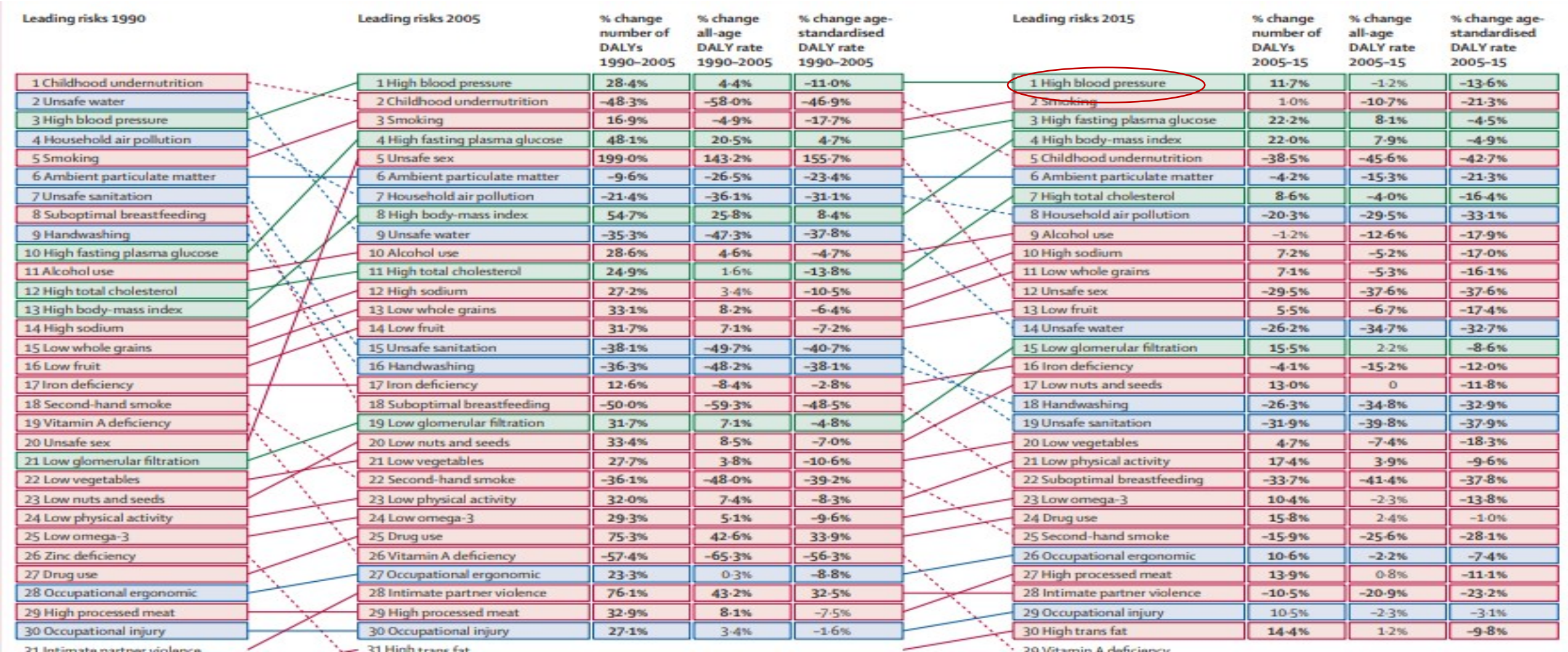
There is a continuous relationship between BP levels and the development of CHD in all ages, genders and ethnic groups.

Overall, at ages 40 – 69 each 20 mm Hg increase in SBP or each 10-mm Hg increase DBP doubles the risk of a fatal coronary event.

The presence of established CHD (myocardial infarction, angina pectoris, and/or myocardial revascularization) automatically stratifies a given patient in the highest risk category, and eliminating the need for further estimation of CV risk.

CHD is the first cause of morbidity and mortality in hypertensive patients

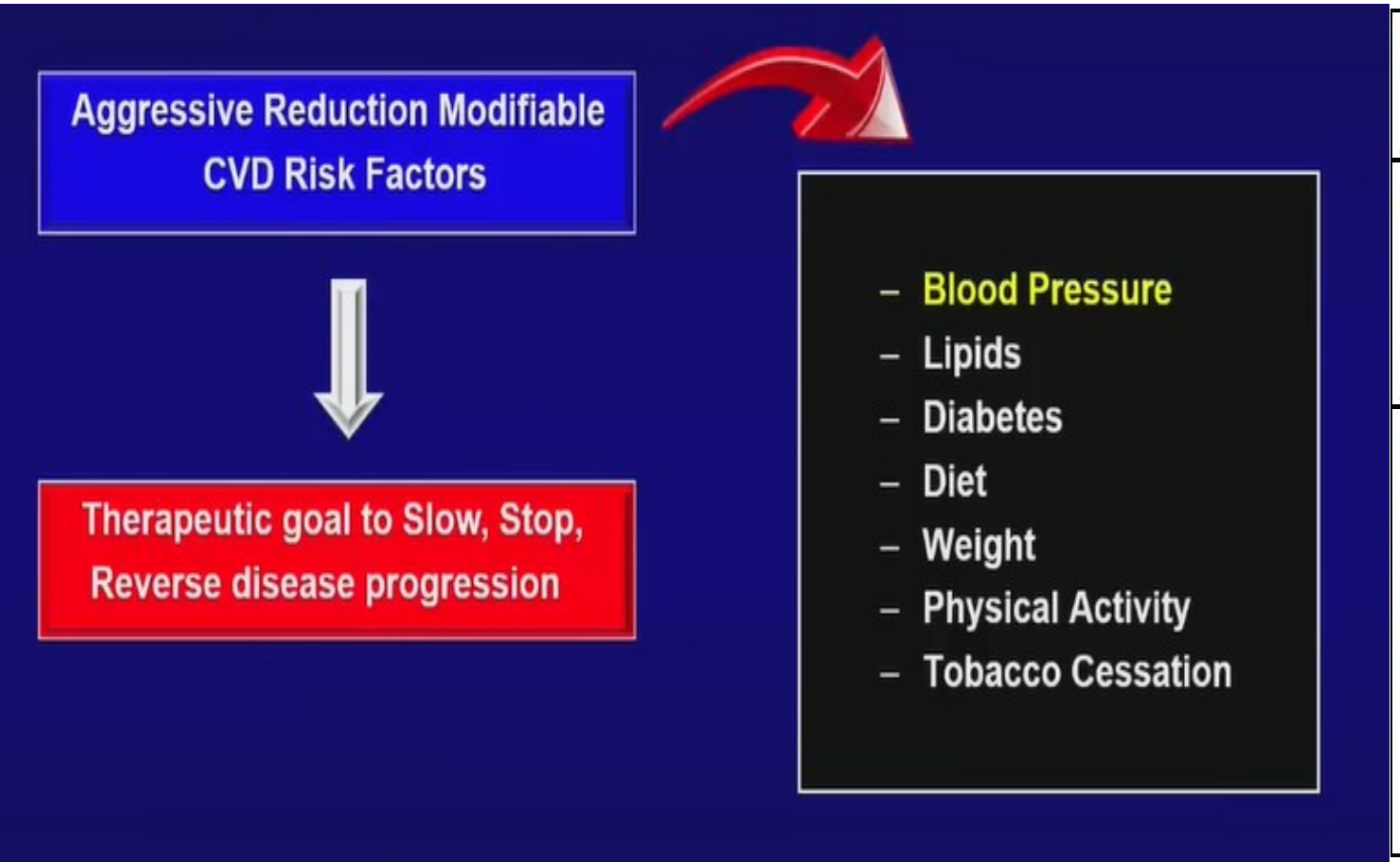
Global, regional, and national comparative risk assessment of 79 behavioural, environmental and occupational, and metabolic risks or clusters of risks, 1990–2015: a systematic analysis for the Global Burden of Disease Study 2015



Leading risks 1990	Leading risks 2005	% change number of DALYs 1990–2005	% change all-age DALY rate 1990–2005	% change age-standardised DALY rate 1990–2005	Leading risks 2015	% change number of DALYs 2005–15	% change all-age DALY rate 2005–15	% change age-standardised DALY rate 2005–15
1 Childhood undernutrition	1 High blood pressure	28·4%	4·4%	−11·0%	1 High blood pressure	11·7%	−1·2%	−13·6%
2 Unsafe water	2 Childhood undernutrition	−48·3%	−58·0%	−46·9%	2 Smoking	1·0%	−10·7%	−21·3%
3 High blood pressure	3 Smoking	16·9%	−4·9%	−17·7%	3 High fasting plasma glucose	22·2%	8·1%	−4·5%
4 Household air pollution	4 High fasting plasma glucose	48·1%	20·5%	4·7%	4 High body-mass index	22·0%	7·9%	−4·9%
5 Smoking	5 Unsafe sex	199·0%	143·2%	155·7%	5 Childhood undernutrition	−38·5%	−45·6%	−42·7%
6 Ambient particulate matter	6 Ambient particulate matter	−9·6%	−26·5%	−23·4%	6 Ambient particulate matter	−4·2%	−15·3%	−21·3%
7 Unsafe sanitation	7 Household air pollution	−21·4%	−36·1%	−31·1%	7 High total cholesterol	8·6%	−4·0%	−16·4%
8 Suboptimal breastfeeding	8 High body-mass index	54·7%	25·8%	8·4%	8 Household air pollution	−20·3%	−29·5%	−33·1%
9 Handwashing	9 Unsafe water	−35·3%	−47·3%	−37·8%	9 Alcohol use	−1·2%	−12·6%	−17·9%
10 High fasting plasma glucose	10 Alcohol use	28·6%	4·6%	−4·7%	10 High sodium	7·2%	−5·2%	−17·0%
11 Alcohol use	11 High total cholesterol	24·9%	1·6%	−13·8%	11 Low whole grains	7·1%	−5·3%	−16·1%
12 High total cholesterol	12 High sodium	27·2%	3·4%	−10·5%	12 Unsafe sex	−29·5%	−37·6%	−37·6%
13 High body-mass index	13 Low whole grains	33·1%	8·2%	−6·4%	13 Low fruit	5·5%	−6·7%	−17·4%
14 High sodium	14 Low fruit	31·7%	7·1%	−7·2%	14 Unsafe water	−26·2%	−34·7%	−32·7%
15 Low whole grains	15 Unsafe sanitation	−38·1%	−49·7%	−40·7%	15 Low glomerular filtration	15·5%	2·2%	−8·6%
16 Low fruit	16 Handwashing	−36·3%	−48·2%	−38·1%	16 Iron deficiency	−4·1%	−15·2%	−12·0%
17 Iron deficiency	17 Iron deficiency	12·6%	−8·4%	−2·8%	17 Low nuts and seeds	13·0%	0	−11·8%
18 Second-hand smoke	18 Suboptimal breastfeeding	−50·0%	−59·3%	−48·5%	18 Handwashing	−26·3%	−34·8%	−32·9%
19 Vitamin A deficiency	19 Low glomerular filtration	31·7%	7·1%	−4·8%	19 Unsafe sanitation	−31·9%	−39·8%	−37·9%
20 Unsafe sex	20 Low nuts and seeds	33·4%	8·5%	−7·0%	20 Low vegetables	4·7%	−7·4%	−18·3%
21 Low glomerular filtration	21 Low vegetables	27·7%	3·8%	−10·6%	21 Low physical activity	17·4%	3·9%	−9·6%
22 Low vegetables	22 Second-hand smoke	−36·1%	−48·0%	−39·2%	22 Suboptimal breastfeeding	−33·7%	−41·4%	−37·8%
23 Low nuts and seeds	23 Low physical activity	32·0%	7·4%	−8·3%	23 Low omega-3	10·4%	−2·3%	−13·8%
24 Low physical activity	24 Low omega-3	29·3%	5·1%	−9·6%	24 Drug use	15·8%	2·4%	−1·0%
25 Low omega-3	25 Drug use	75·3%	42·6%	33·9%	25 Second-hand smoke	−15·9%	−25·6%	−28·1%
26 Zinc deficiency	26 Vitamin A deficiency	−57·4%	−65·3%	−56·3%	26 Occupational ergonomic	10·6%	−2·2%	−7·4%
27 Drug use	27 Occupational ergonomic	23·3%	0·3%	−8·8%	27 High processed meat	13·9%	0·8%	−11·1%
28 Occupational ergonomic	28 Intimate partner violence	76·1%	43·2%	32·5%	28 Intimate partner violence	−10·5%	−20·9%	−23·2%
29 High processed meat	29 High processed meat	32·9%	8·1%	−7·5%	29 Occupational injury	10·5%	−2·3%	−3·1%
30 Occupational injury	30 Occupational injury	27·1%	3·4%	−1·6%	30 High trans fat	14·4%	1·2%	−9·8%
31 Intimate partner violence	31 High trans fat				29 Vitamin A deficiency			

2023 ESH Guidelines for the management of arterial hypertension

The Task Force for the management of arterial hypertension of the European Society of Hypertension



Recommendations and statements	CoR	LoE
Antihypertensive treatment of hypertension is recommended to effectively prevent CAD.	I	A
Antihypertensive treatment with all major antihypertensive drug classes including ACEis, ARBs, BBs, CCBs and Thiazide/Thiazide-like diuretics can be used for the prevention of CAD.	I	A

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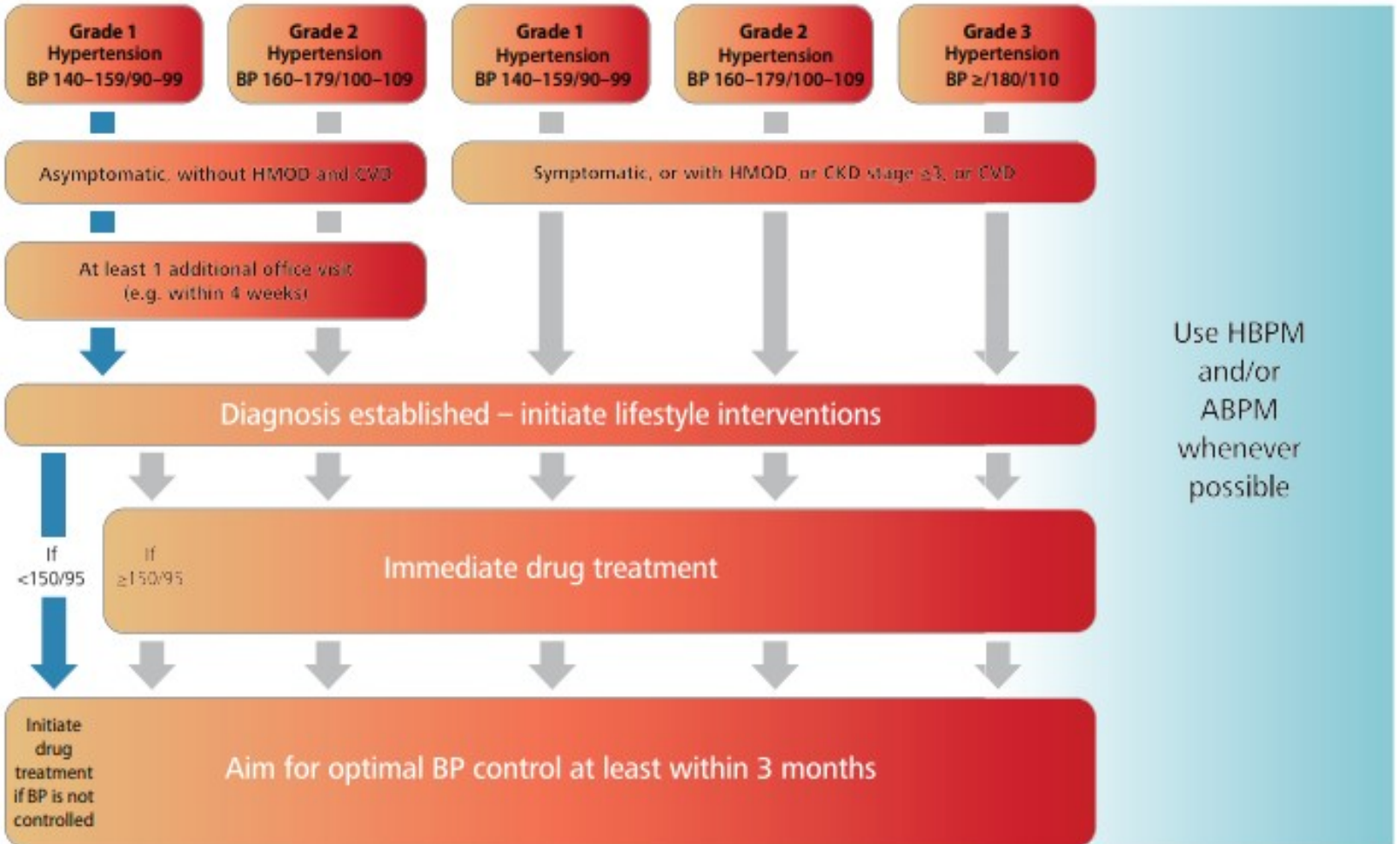


2023 ESH Guidelines for the management of arterial hypertension

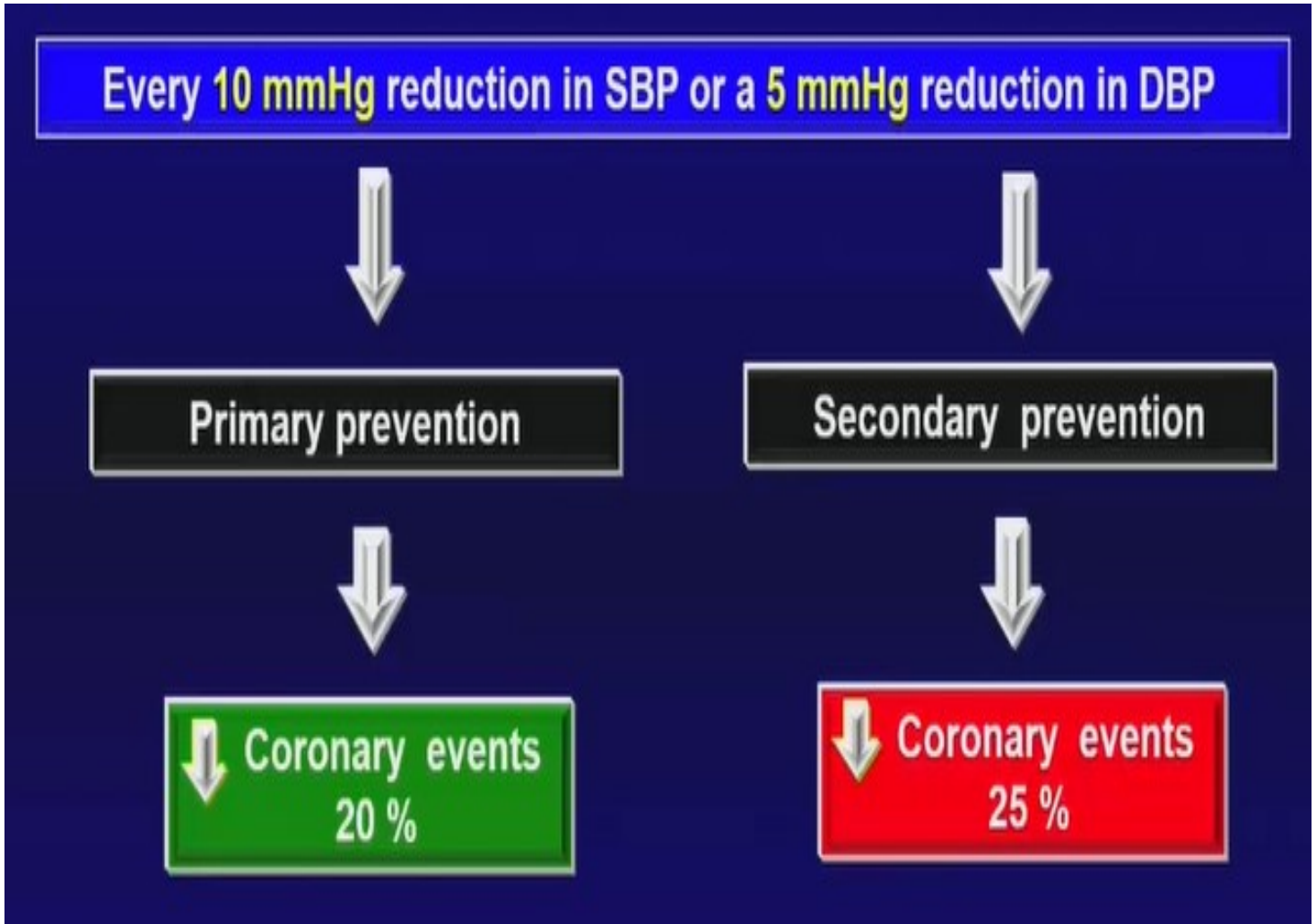
The Task Force for the management of arterial hypertension of the European Society of Hypertension

In adult patients with a history of CVD, predominantly CAD, drug treatment should be initiated in the high-normal BP range (SBP ≥130 or DBP ≥80 mmHg).	I	A

JAMA Internal Medicine | Original Investigation

Association of Blood Pressure Lowering With Mortality and Cardiovascular Disease Across Blood Pressure Levels

A Systematic Review and Meta-analysis



2023 ESH Guidelines for the management of arterial hypertension

The Task Force for the management of arterial hypertension of the European Society of Hypertension

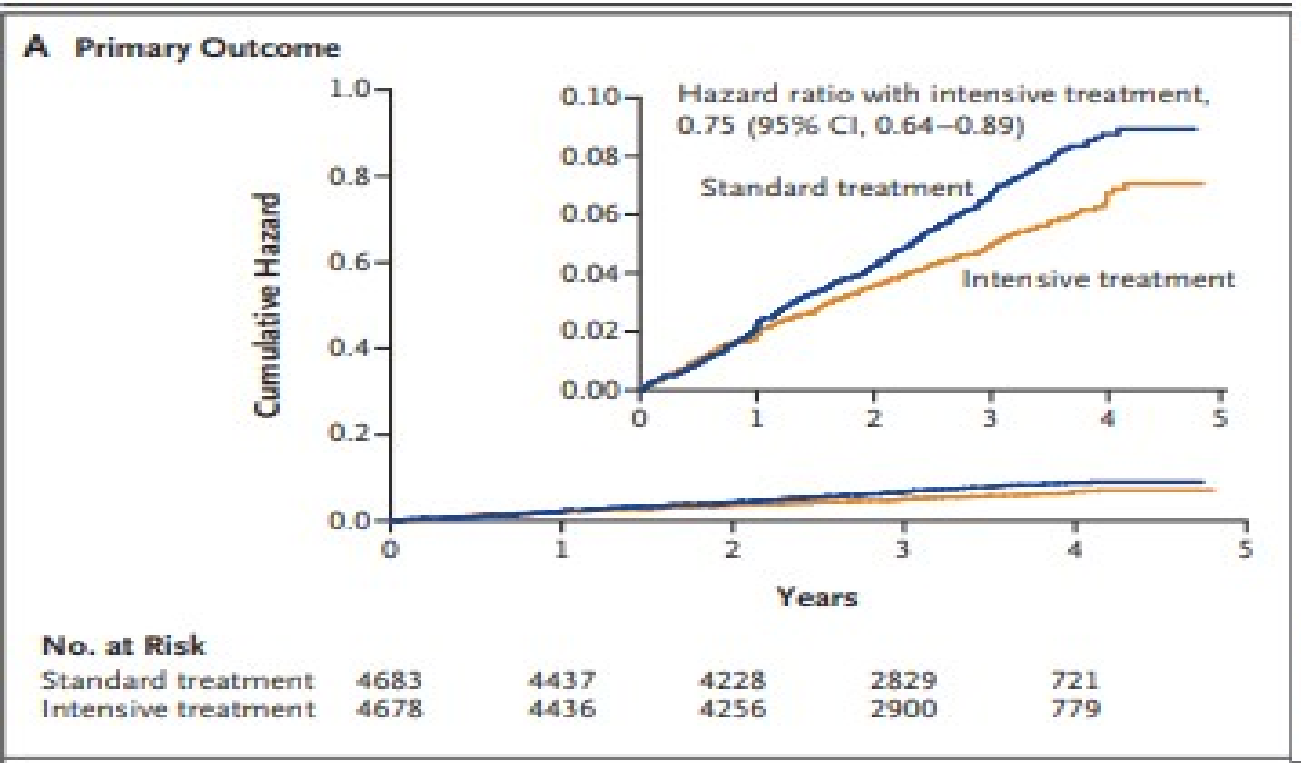
Recommendations and statements	CoR	LoE
Patients 18 to 64 years old		
The goal is to lower office BP to <130/80mmHg.	I	A
Patients 65 to 79 years old		
The primary goal of treatment is to lower BP to <140/80mmHg.	I	A
However, lowering BP to below 130/80mmHg can be considered if treatment is well tolerated.	II	B

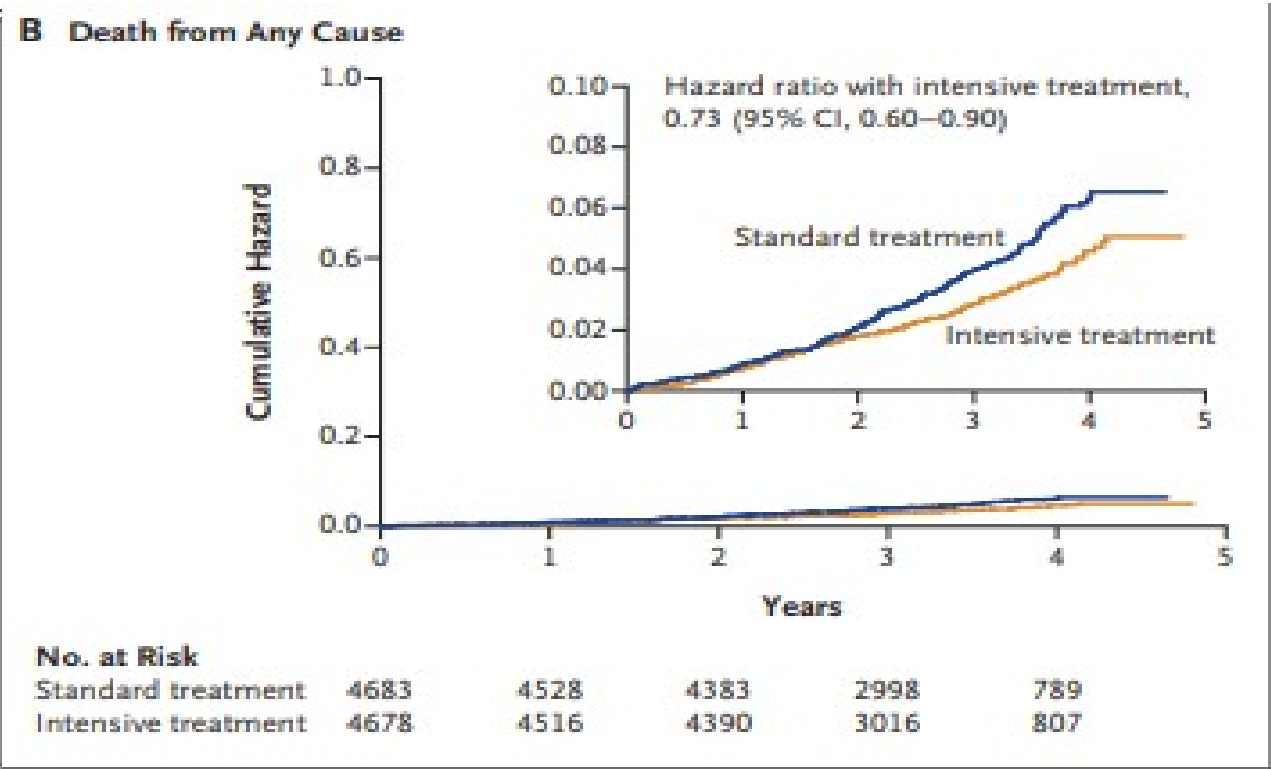
The NEW ENGLAND JOURNAL of MEDICINE

ESTABLISHED IN 1812 NOVEMBER 26, 2015 VOL. 373 NO. 22

A Randomized Trial of Intensive versus Standard Blood-Pressure Control

The SPRINT Research Group*





The NEW ENGLAND JOURNAL of MEDICINE

ESTABLISHED IN 1812 NOVEMBER 26, 2015 VOL. 373 NO. 22

A Randomized Trial of Intensive versus Standard Blood-Pressure Control

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Table 2. Primary and Secondary Outcomes and Renal Outcomes.*

Outcome	Intensive Treatment		Standard Treatment		Hazard Ratio (95% CI)	P Value
	no. of patients (%)	*% per year*	*no. of patients (%)*	*% per year*		
All participants	**(N=4678)**		**(N=4683)**			
Primary outcome†	243 (5.2)	1.65	319 (6.8)	2.19	0.75 (0.64–0.89)	<0.001
Secondary outcomes						
Myocardial infarction	97 (2.1)	0.65	116 (2.5)	0.78	0.83 (0.64–1.09)	0.19
Acute coronary syndrome	40 (0.9)	0.27	40 (0.9)	0.27	1.00 (0.64–1.55)	0.99
Stroke	62 (1.3)	0.41	70 (1.5)	0.47	0.89 (0.63–1.25)	0.50
Heart failure	62 (1.3)	0.41	100 (2.1)	0.67	0.62 (0.45–0.84)	0.002
Death from cardiovascular causes	37 (0.8)	0.25	65 (1.4)	0.43	0.57 (0.38–0.85)	0.005
Death from any cause	155 (3.3)	1.03	210 (4.5)	1.40	0.73 (0.60–0.90)	0.003
Primary outcome or death	332 (7.1)	2.25	423 (9.0)	2.90	0.78 (0.67–0.90)	<0.001
Participants with CKD at baseline	**(N=1330)**		**(N=1316)**			
Composite renal outcome‡	14 (1.1)	0.33	15 (1.1)	0.36	0.89 (0.42–1.87)	0.76
≥50% reduction in estimated GFR§	10 (0.8)	0.23	11 (0.8)	0.26	0.87 (0.36–2.07)	0.75
Long-term dialysis	6 (0.5)	0.14	10 (0.8)	0.24	0.57 (0.19–1.54)	0.27
Kidney transplantation	0		0			
Incident albuminuria¶	49/526 (9.3)	3.02	59/500 (11.8)	3.90	0.72 (0.48–1.07)	0.11
Participants without CKD at baseline‖	**(N=3332)**		**(N=3345)**			
≥30% reduction in estimated GFR to <60 ml/min/1.73 m^2§	127 (3.8)	1.21	37 (1.1)	0.35	3.49 (2.44–5.10)	<0.001
Incident albuminuria¶	110/1769 (6.2)	2.00	135/1831 (7.4)	2.41	0.81 (0.63–1.04)	0.10

The NEW ENGLAND JOURNAL of MEDICINE

ESTABLISHED IN 1812 NOVEMBER 26, 2015 VOL. 373 NO. 22

A Randomized Trial of Intensive versus Standard Blood-Pressure Control

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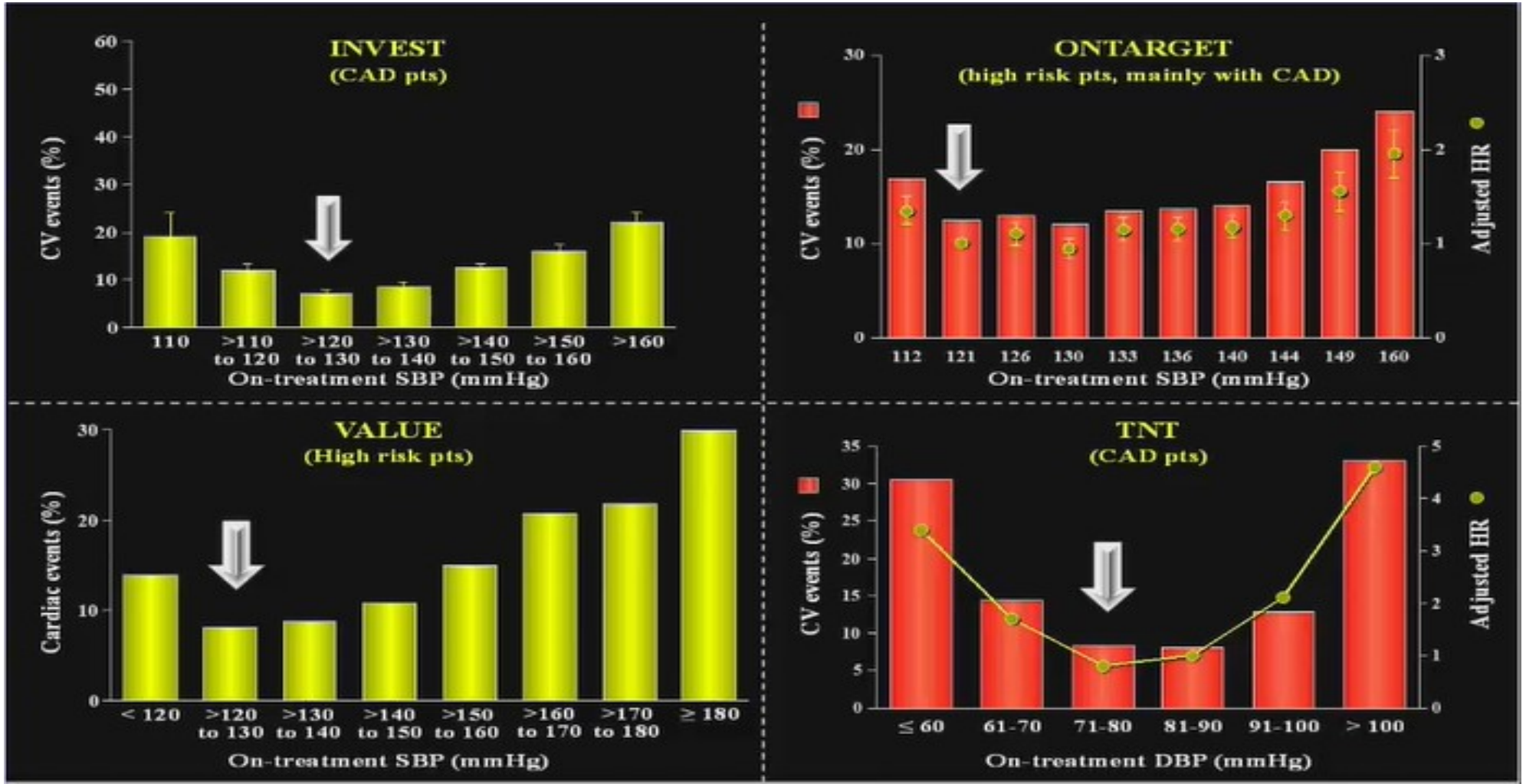
Variable	Intensive Treatment (N = 4678)	Standard Treatment (N = 4683)	Hazard Ratio	P Value
	no. of patients (%)			
Serious adverse event*	1793 (38.3)	1736 (37.1)	1.04	0.25
Conditions of interest				
Serious adverse event only				
Hypotension	110 (2.4)	66 (1.4)	1.67	0.001
Syncope	107 (2.3)	80 (1.7)	1.33	0.05
Bradycardia	87 (1.9)	73 (1.6)	1.19	0.28
Electrolyte abnormality	144 (3.1)	107 (2.3)	1.35	0.02
Injurious fall†	105 (2.2)	110 (2.3)	0.95	0.71
Acute kidney injury or acute renal failure‡	193 (4.1)	117 (2.5)	1.66	<0.001
Emergency department visit or serious adverse event				
Hypotension	158 (3.4)	93 (2.0)	1.70	<0.001
Syncope	163 (3.5)	113 (2.4)	1.44	0.003
Bradycardia	104 (2.2)	83 (1.8)	1.25	0.13
Electrolyte abnormality	177 (3.8)	129 (2.8)	1.38	0.006
Injurious fall†	334 (7.1)	332 (7.1)	1.00	0.97
Acute kidney injury or acute renal failure‡	204 (4.4)	120 (2.6)	1.71	<0.001

Randomized Controlled Trials of Blood Pressure Lowering in Hypertension

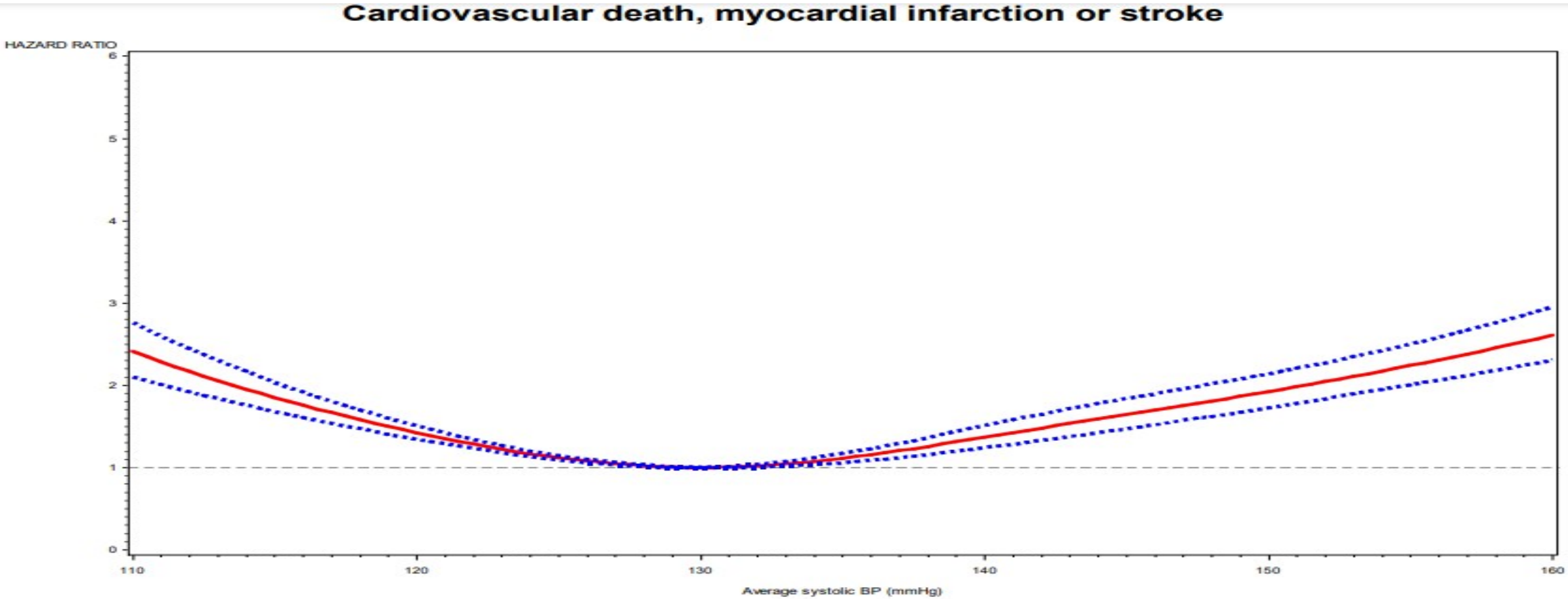
A Critical Reappraisal

Alberto Zanchetti, Costas Thomopoulos, Gianfranco Parati

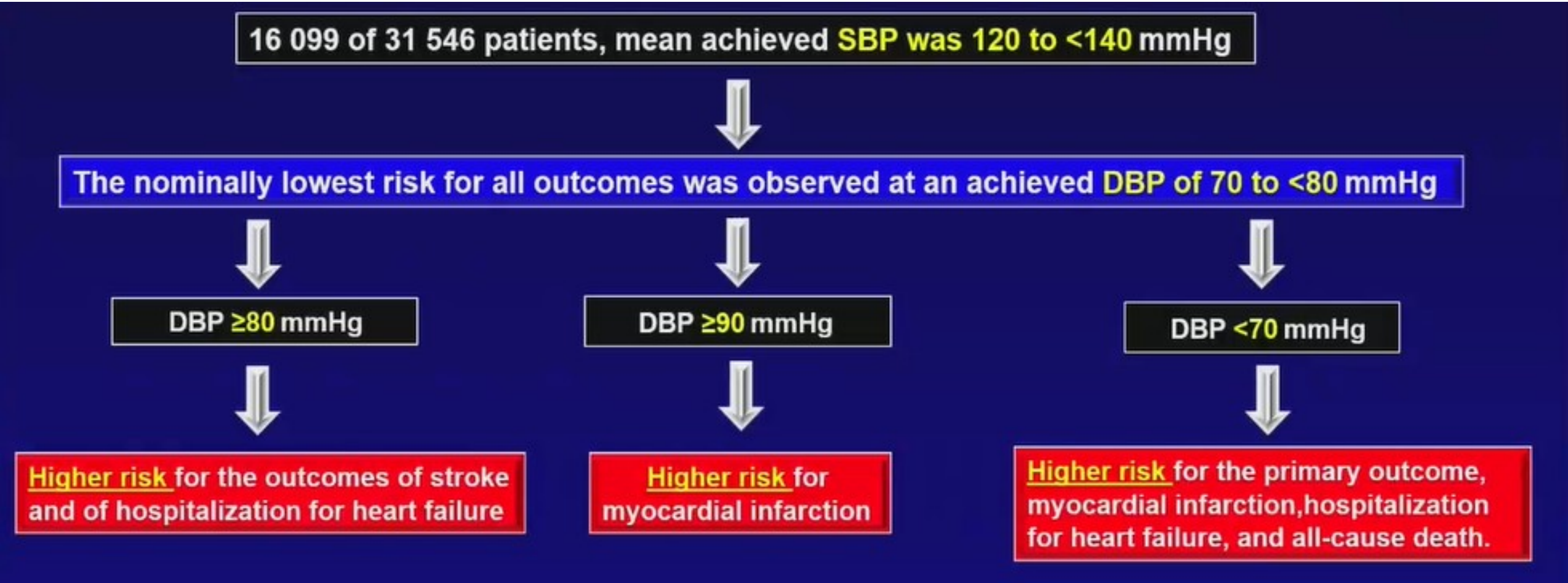


THE LANCET

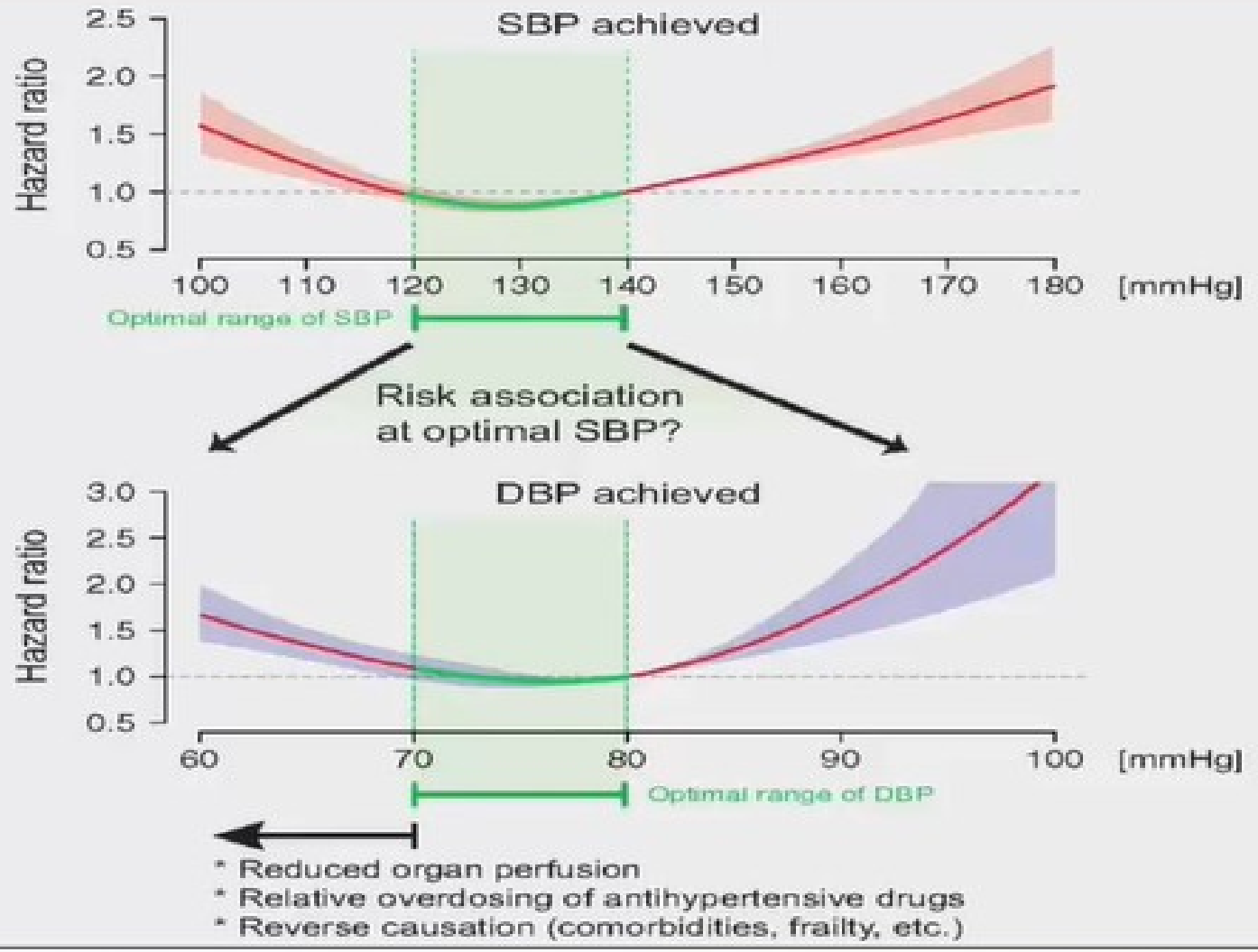
Cardiovascular event rates and mortality according to achieved systolic and diastolic blood pressure in patients with stable coronary artery disease: an international cohort study



Results of the ONTARGET and TRANSCEND studies: an update and discussion



Results of the ONTARGET and TRANSCEND studies: an update and discussion



2023 ESH Guidelines for the management of arterial hypertension

The Task Force for the management of arterial hypertension of the European Society of Hypertension

In patients with hypertension and CAD it is recommended to use drugs with documented favorable effects in CAD such as ACEis (ARBs if not tolerated) or BBs.	I	A
In patients with hypertension and CAD with angina pectoris, BBs and both DHP and non-DHP CCBs are particularly useful.	I	A
To lower heart rate to a range between 60 to 80 beats per minute is an additional treatment goal in hypertensive patients with CAD for which BB or non-DHP CCBs can be used.	I	B

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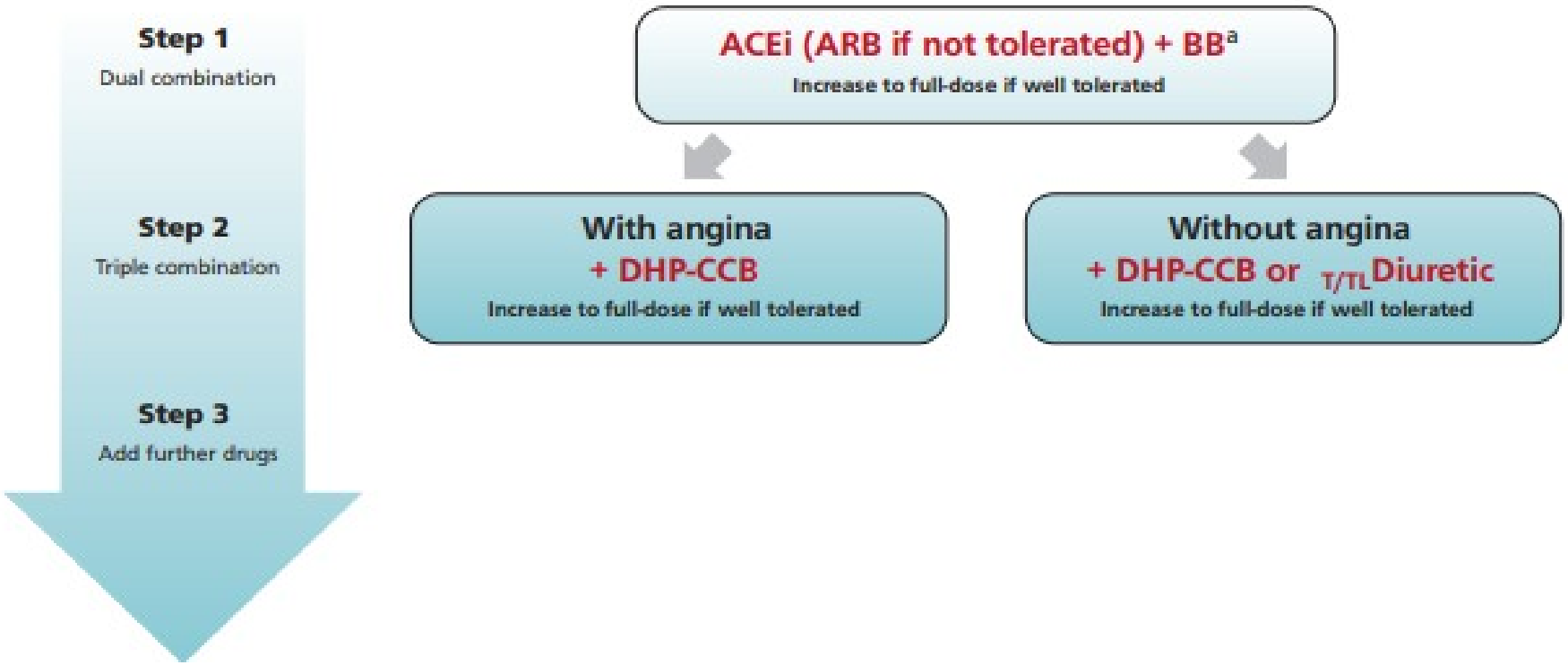

2023 ESH Guidelines for the management of arterial hypertension

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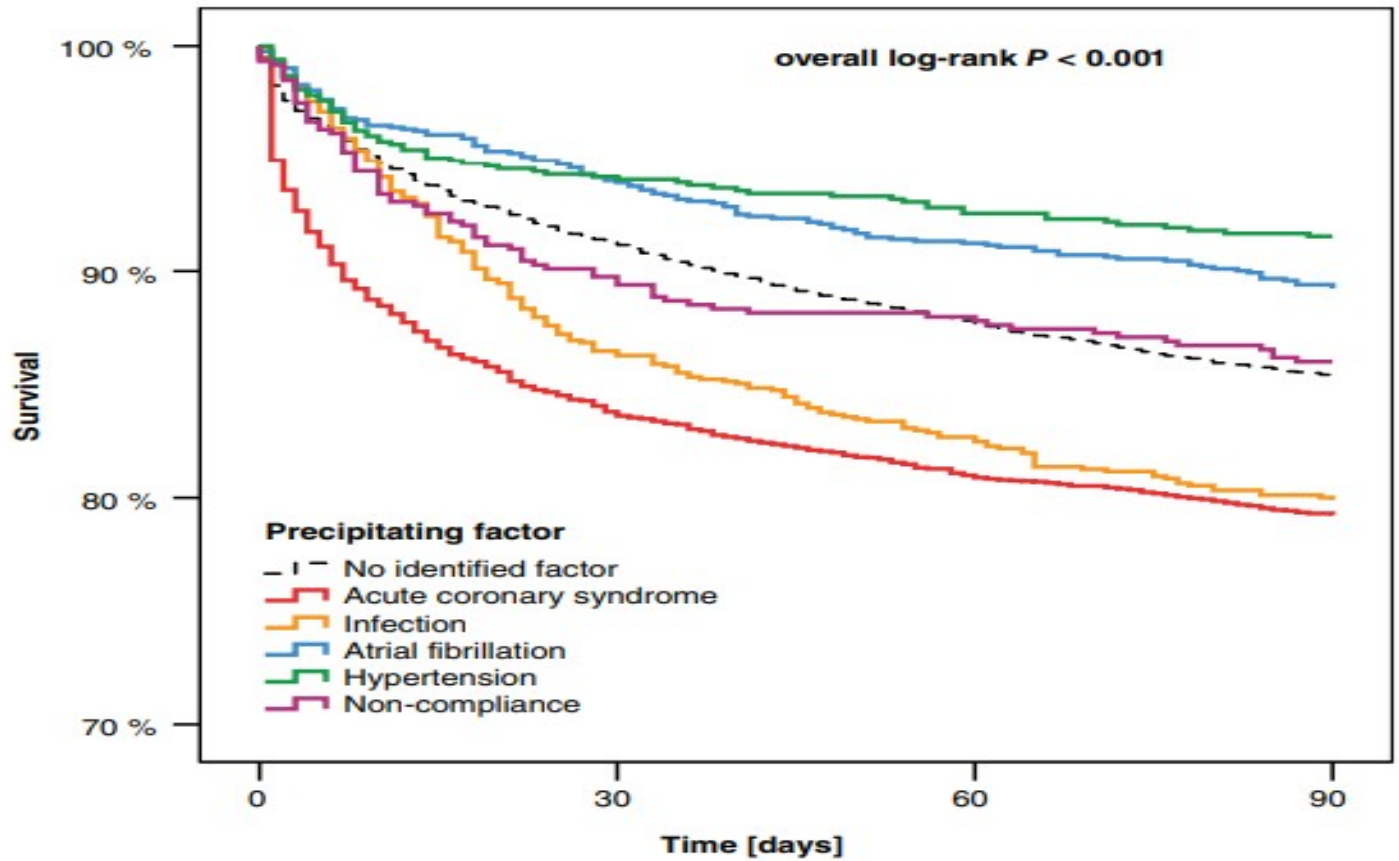
In adult patients with a history of CVD, predominantly CAD, drug treatment should be initiated in the high-normal BP range (SBP ≥130 or DBP ≥80 mmHg).	I	A

Initiation with monotherapy should be considered in patients with: • grade 1 hypertension and low-risk if BP is only marginally elevated (less than 150 mmHg SBP and 95 mmHg DBP) • high-normal BP and very high CV risk, • frailty and/or and advance age.	I	C

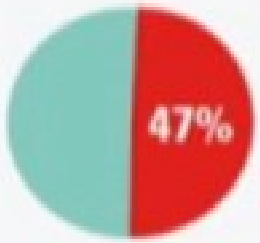
European Journal of Heart Failure (2016)
doi:10.1002/ejhf.682

Precipitating factors and 90-day outcome of acute heart failure: a report from the intercontinental GREAT registry



The most important modifiable RF for CHD, stroke, HF, CKD

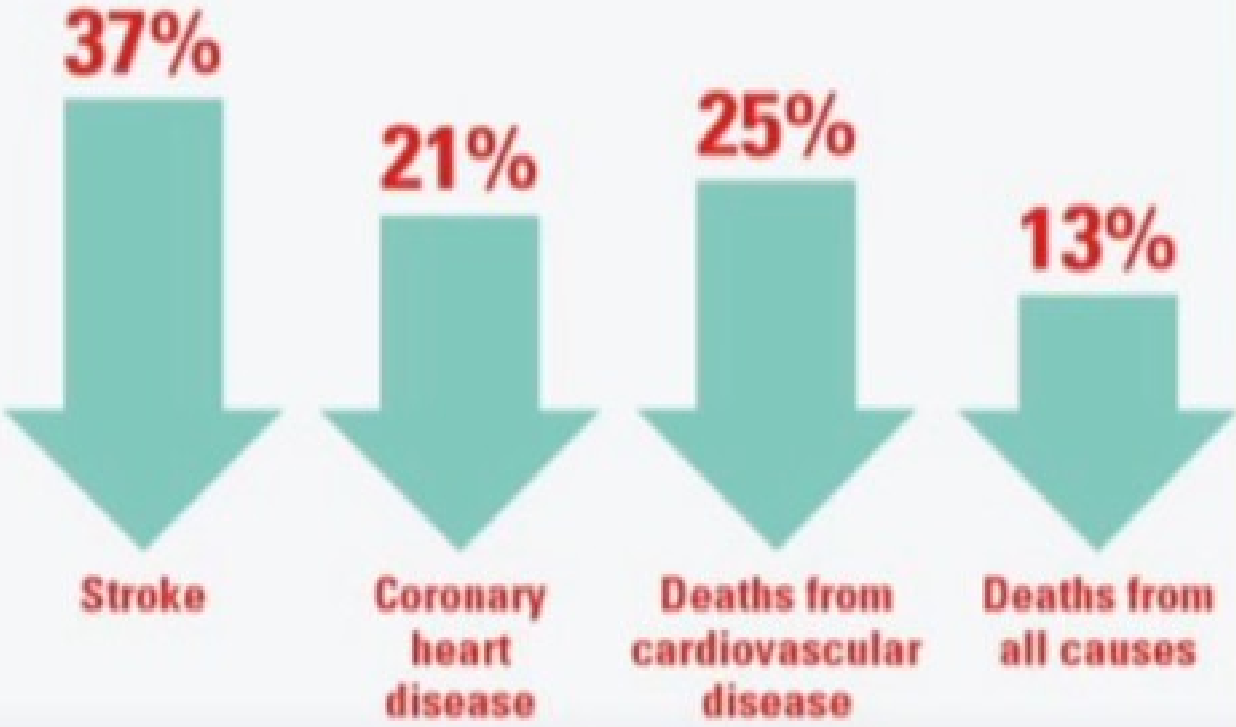
BLOOD PRESSURE CONTROL



ONLY ABOUT HALF

of people with high blood pressure have their condition under control

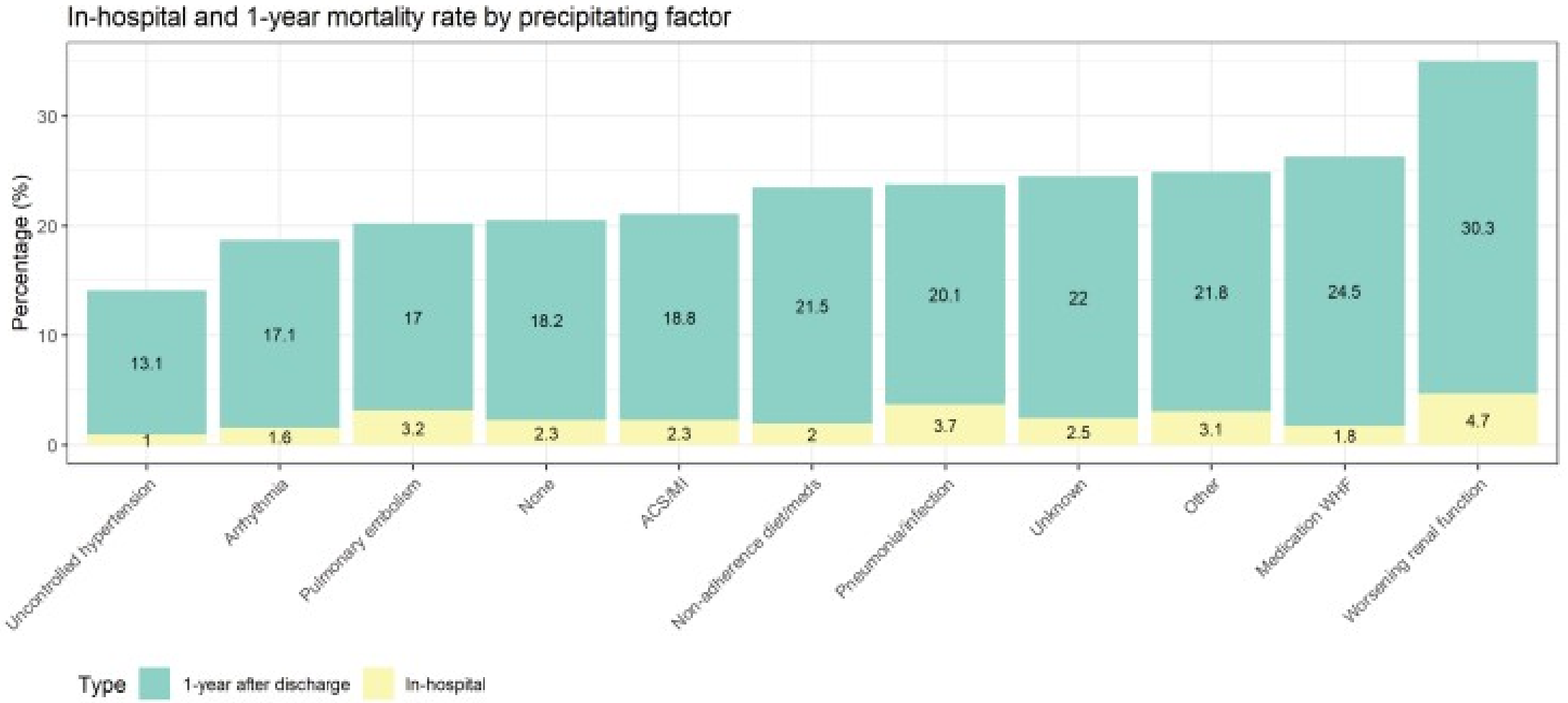
Reducing average population systolic blood pressure by **only 12–13 mmHg** could reduce:



ESC European Society of Cardiology
European Journal of Heart Failure (2022)
doi:10.1002/ejhf.2431

RESEARCH ARTICLE

Regional differences in precipitating factors of hospitalization for acute heart failure: insights from the REPORT-HF registry



2023 ESH Guidelines for the management of arterial hypertension

The Task Force for the management of arterial hypertension of the European Society of Hypertension

Recommendations and statements	CoR	LoE
Treatment of hypertension is recommended to effectively prevent heart failure.	I	A
Hypertension treatment with all major antihypertensive drug classes, including ACEis, ARBs, BBs, CCBs and Thiazide/Thiazide-like diuretics, can be used for the prevention of heart failure.	I	A
Given the fundamental importance of BP control for HF prevention, additional available antihypertensive agents can be used if this goal is not achieved by use of the 5 major antihypertensive drugs and their combinations.	I	B
SGLT2is should be used for the prevention of heart failure in patients with type-2 diabetes.	I	A

ESC
European Society of Cardiology
European Heart Journal (2021) **00**, 1–128
doi:10.1093/eurheartj/ehab368

ESC GUIDELINES

2021 ESC Guidelines for the diagnosis and treatment of acute and chronic heart failure

Management of HFrEF

To reduce mortality - for all patients

ACE-I/ARNI | BB | MRA | SGLT2i

To reduce HF hospitalization/mortality - for selected patients

Volume overload

Diuretics

2023 ESH Guidelines for the management of arterial hypertension

The Task Force for the management of arterial hypertension of the European Society of Hypertension

Treatment of hypertension in heart failure with reduced ejection fraction (HFrEF)

Recommendations and statements	CoR	LoE
In patients with hypertension and heart failure with reduced ejection fraction (HFrEF) it is recommended to combine drugs with documented outcome benefits including ACEis (ARBs if not tolerated), which could be substituted by ARNI (sacubitril/valsartan), BBs, MRAs, and SGLT2is, if not contraindicated and well tolerated.	I	A
If patients remain with uncontrolled hypertension despite up-titration of drugs from the four major drug classes (RAS-inhibitors, BBs, MRAs, and SGLT2is) and use of additional treatment with a diuretic to manage fluid balance, a DHP-CCB can be added for BP control.	I	B
Use of non-DHP-CCB is not recommended in HFrEF due to their pronounced negative-inotropic effect	III	C

Therapeutic strategies in hypertensive patients with heart failure or LVH

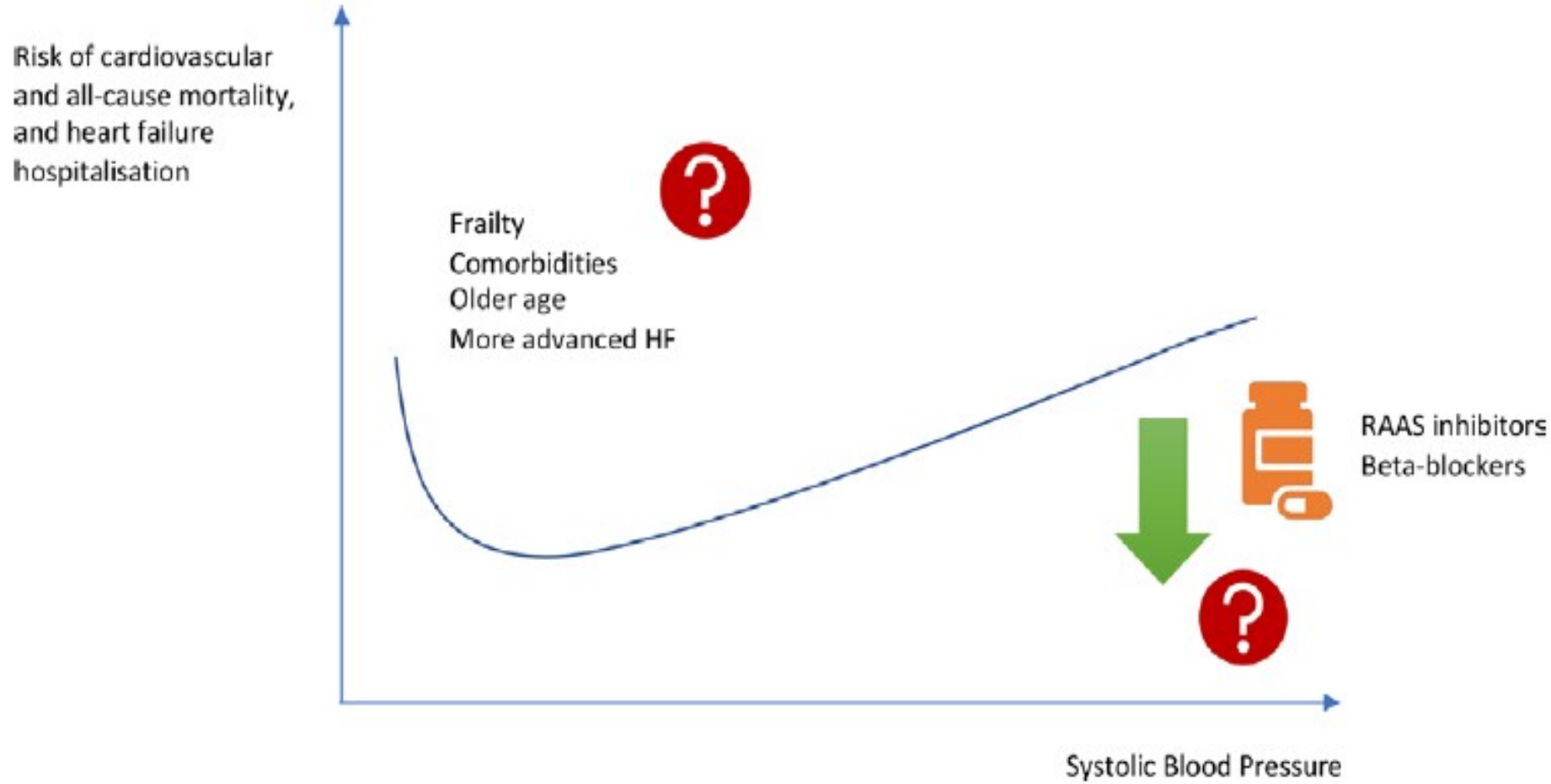
Recommendations	Class[a]	Level[b]
In hypertensive patients with heart failure (with reduced or preserved ejection fraction), BP-lowering treatment should be considered if BP is ≥140/90 mmHg.[c 136]	IIa	B
In patients with HFrEF, it is recommended that BP-lowering treatment comprises an ACE inhibitor or ARB, and a beta-blocker and diuretic and/or MRA if required.[136]	I	A

2023 ESH Guidelines for the management of arterial hypertension

The Task Force for the management of arterial hypertension of the European Society of Hypertension

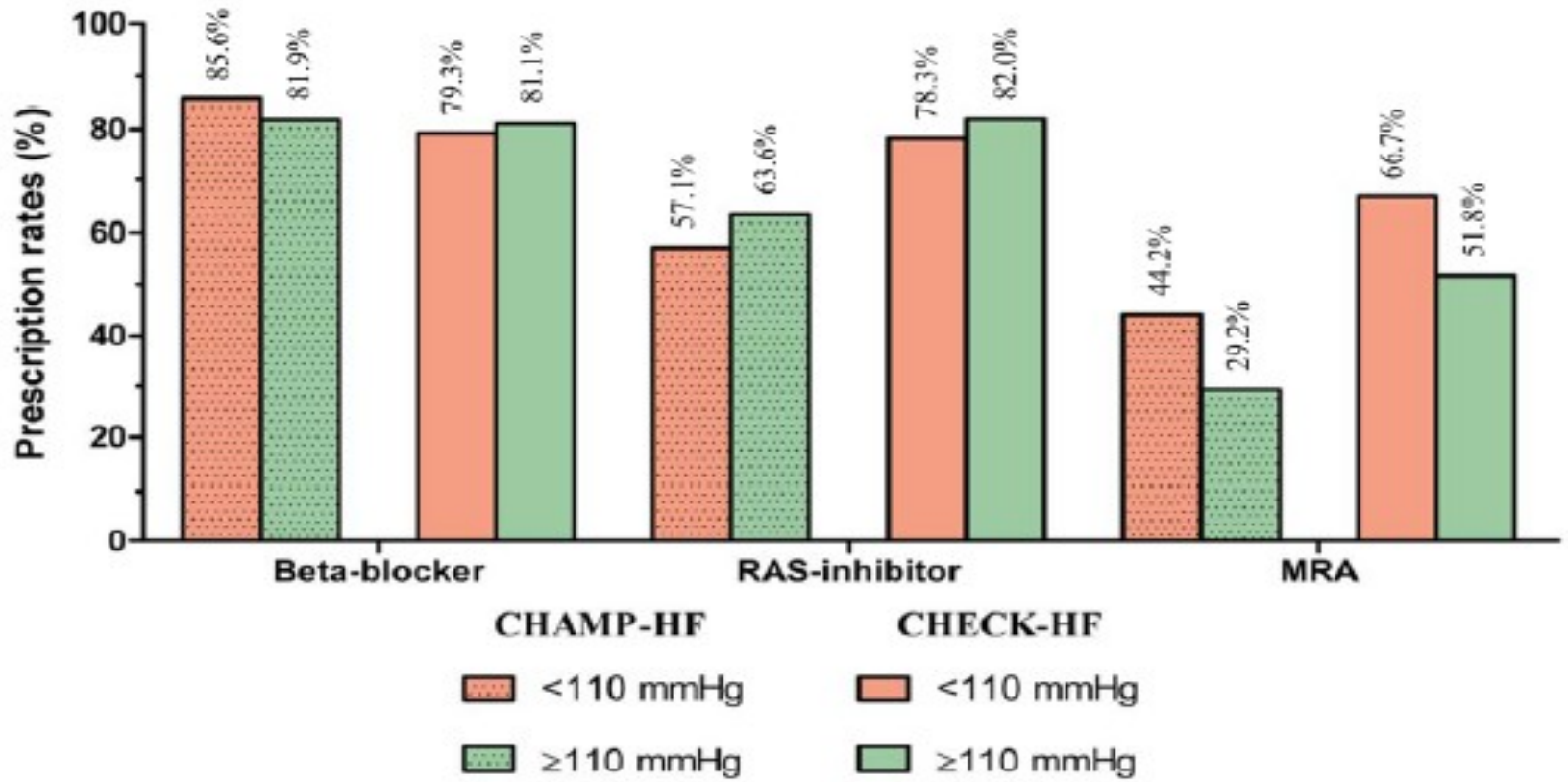
Recommendations and statements	CoR	LoE
Patients 18 to 64 years old		
The goal is to lower office BP to <130/80mmHg.	I	A
Patients 65 to 79 years old		
The primary goal of treatment is to lower BP to <140/80mmHg.	I	A
However, lowering BP to below 130/80mmHg can be considered if treatment is well tolerated.	II	B

Management of blood pressure in heart failure



ORIGINAL ARTICLE

Treatment Differences in Chronic Heart Failure Patients With Reduced Ejection Fraction According to Blood Pressure



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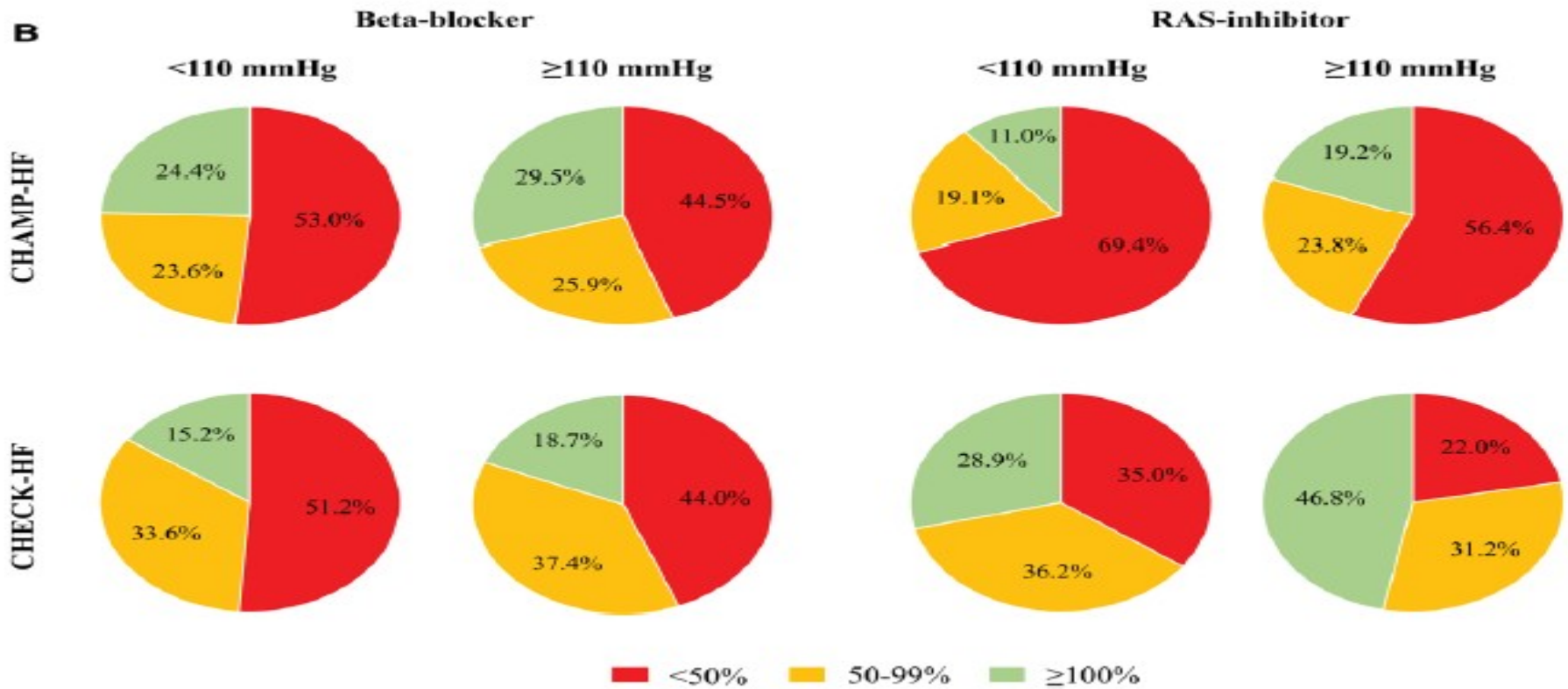
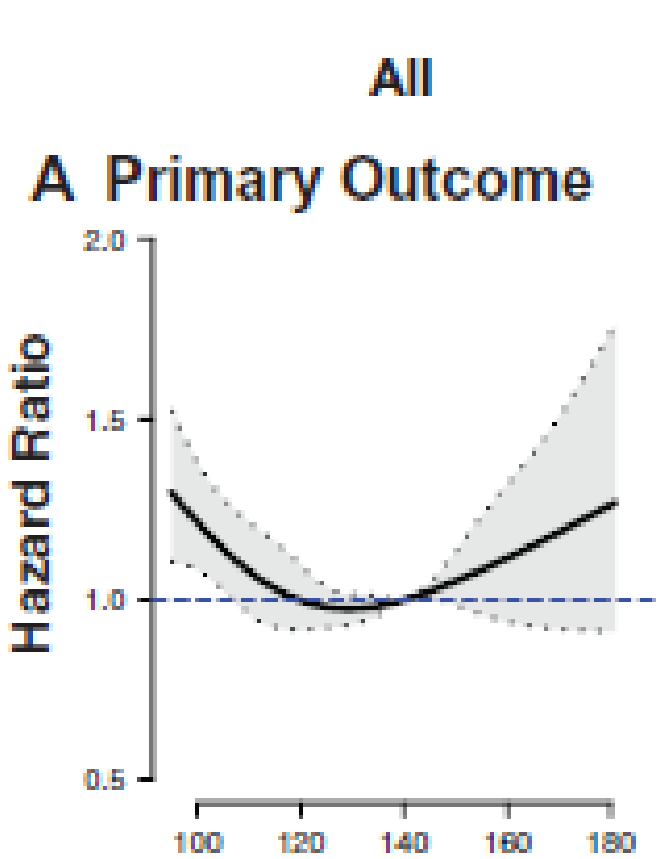
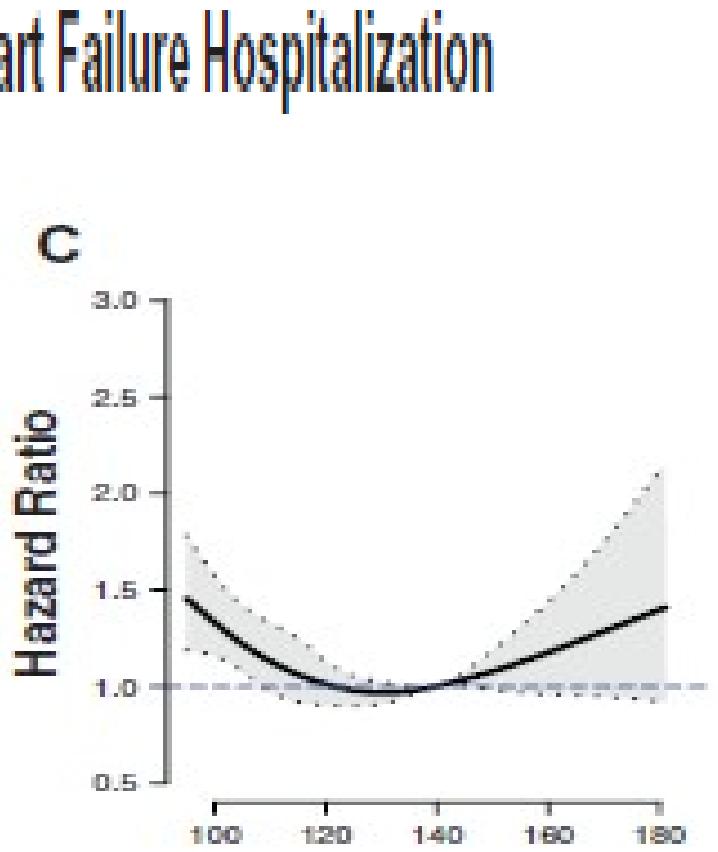


Systolic blood pressure, cardiovascular outcomes and efficacy and safety of sacubitril/valsartan (LCZ696) in patients with chronic heart failure and reduced ejection fraction: results from PARADIGM-HF

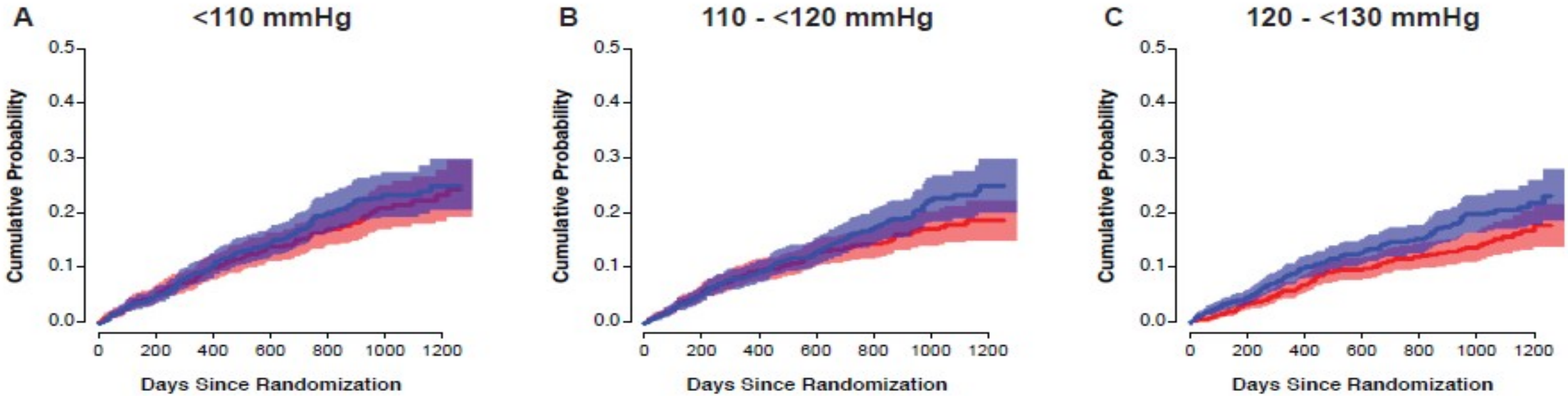




Systolic blood pressure, cardiovascular outcomes and efficacy and safety of sacubitril/valsartan (LCZ696) in patients with chronic heart failure and reduced ejection fraction: results from PARADIGM-HF

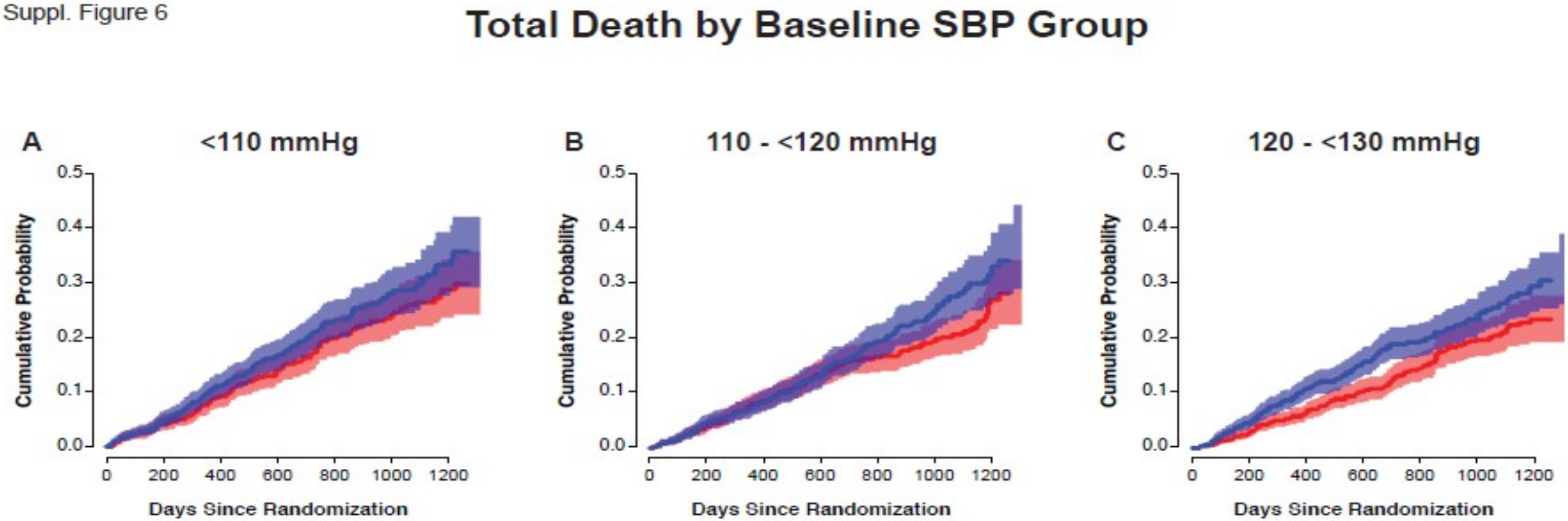
Suppl. Figure 5

Hospitalization for Heart Failure by Baseline SBP Group



Systolic blood pressure, cardiovascular outcomes and efficacy and safety of sacubitril/valsartan (LCZ696) in patients with chronic heart failure and reduced ejection fraction: results from PARADIGM-HF

Suppl. Figure 6

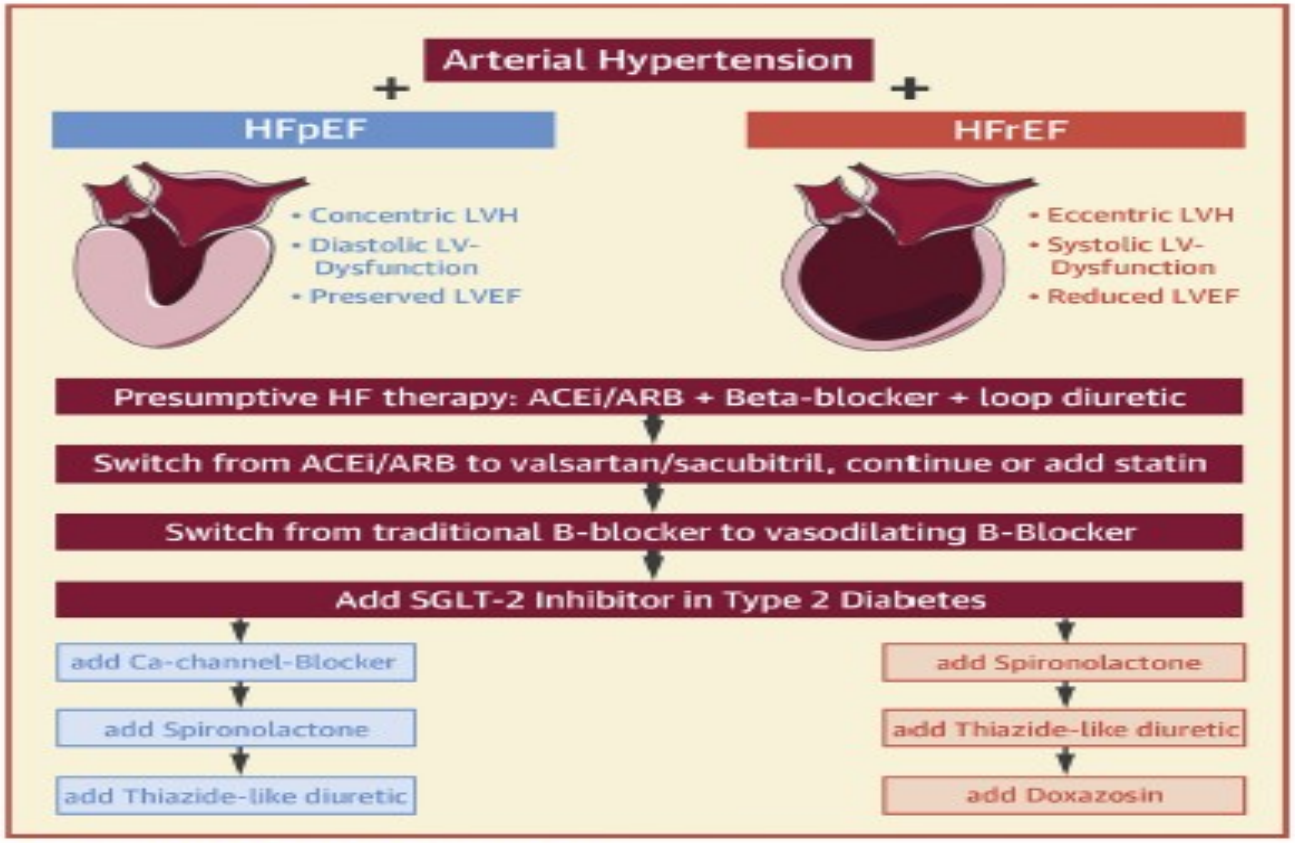


The Transition From Hypertension to Heart Failure

Contemporary Update

Franz H. Messerli, MD,[a,b,c] Stefano F. Rimoldi, MD,[a] Sripal Bangalore, MD[d]

CENTRAL ILLUSTRATION **Suggested Empirical Antihypertensive Strategy in HF Patients With Persisting Hypertension**



Messerli, F.H. et al. J Am Coll Cardiol HF. 2017;5(8):543-51.

ACEi = angiotensin-converting enzyme inhibitor; ARB = angiotensin receptor blocker; Ca = calcium; HF = heart failure; HFpEF = heart failure with preserved ejection fraction; HFrEF = heart failure with reduced ejection fraction; LV = left ventricular; LVEF = left ventricular ejection fraction; LVH = left ventricular hypertrophy; SGLT2 = sodium-glucose co-transporter 2 inhibitor.

Recommendations for the treatment of hypertension in patients with symptomatic (NYHA Class II-IV) heart failure with reduced ejection fraction

Recommendations	Class [a]	Level [b]	Ref [c]
Step 1			
ACE-I (or ARB), a beta-blocker or an MRA (or a combination) is recommended to reduce blood pressure as first-, second- and third-line therapy, respectively, because of their associated benefits in HFrEF (reducing the risk of death and HF hospitalization). They are also safe in HFpEF.	I	A	2, 164, 165, 167, 168, 171–174, 182, 461–463
Step 2			
A thiazide diuretic (or if the patient is being treated with a thiazide diuretic, switching to a loop diuretic) is recommended to reduce blood pressure when hypertension persists despite treatment with a combination of an ACE-I (or alternatively ARB but NOT together withan ACE-I), a beta-blocker and an MRA.	I	C	
Step 3			
Amlodipine or hydralazine is recommended to reduce blood pressure when hypertension persists despite treatment with a combination of an ACE-I (or alternatively ARB but NOT together withan ACE-I), a beta-blocker, an MRA and a diuretic.	I	A	183, 184, 215, 409
Felodipine should be considered to reduce blood pressure when hypertension persists despite treatment with a combination of an ACE-I (or alternatively ARB but NOT together withan ACE-I), a beta-blocker, an MRA and a diuretic.	IIa	B	216
Moxonidine is not recommended to reduce blood pressure because of safety concerns in HFrEF patients (increased mortality).	III	B	460
Alpha-adrenoceptor antagonists are not recommended to reduce blood pressure because of safety concerns in HFrEF patients (neurohormonal activation, fluid retention, worsening HF).	III	A	458, 464, 465
Diltiazem and verapamil are not recommended to reduce blood pressure in patients with HFrEF because of their negative inotropic action and risk of worsening HF.	III	C	214

ACE = angiotensin-converting enzyme; ARB = angiotensin receptor blocker; HF = heart failure; HFmrEF = heart failure with mid-range ejection fraction; HFpEF = heart failure with preserved ejection fraction; HFrEF = heart failure with reduced ejection fraction; MRA = mineralocorticoid receptor antagonist; NYHA = New York Heart Association.
[a] Class of recommendation

European Heart Journal (2017) 38, 1132–1143
doi:10.1093/eurheartj/ehw570

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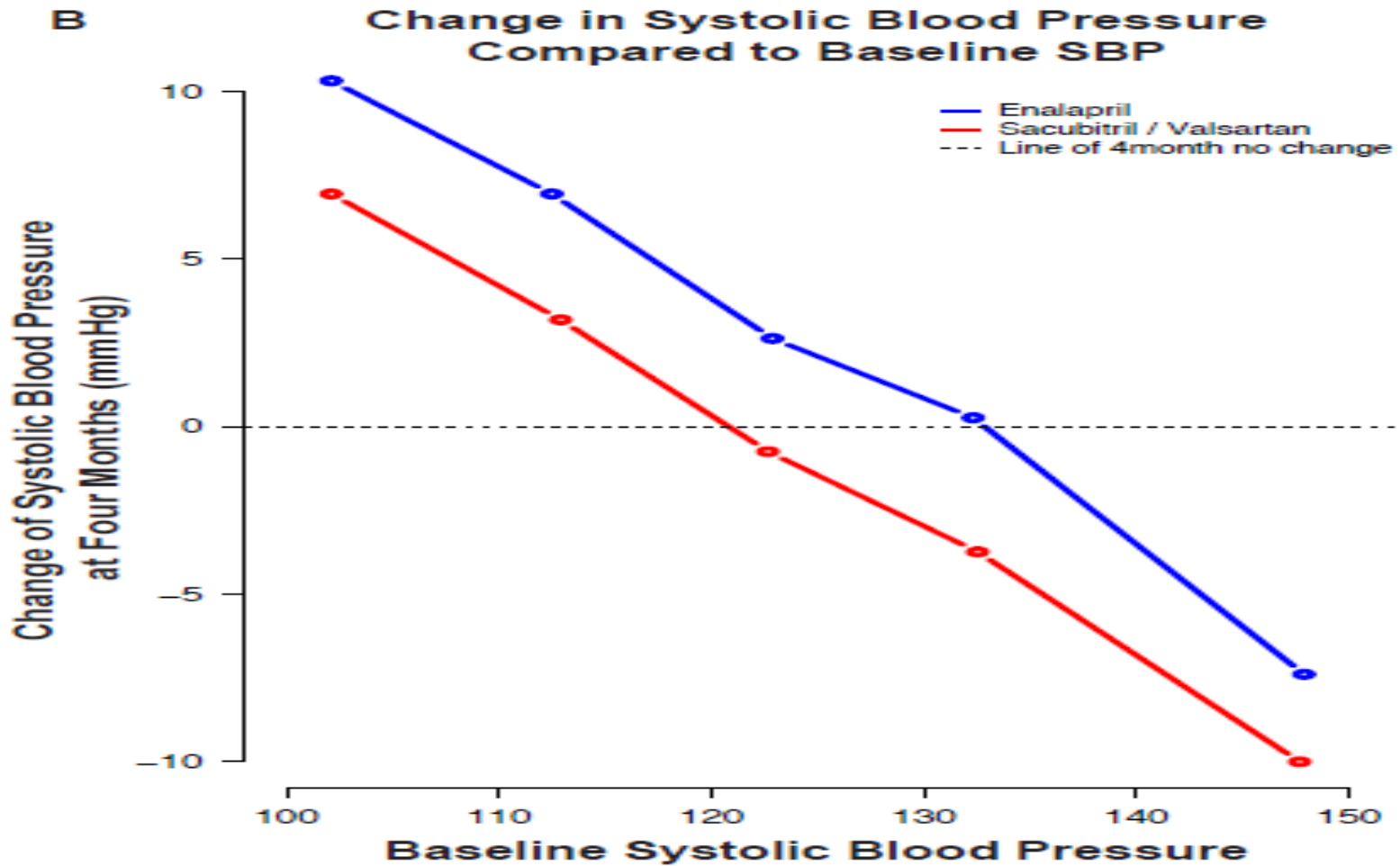
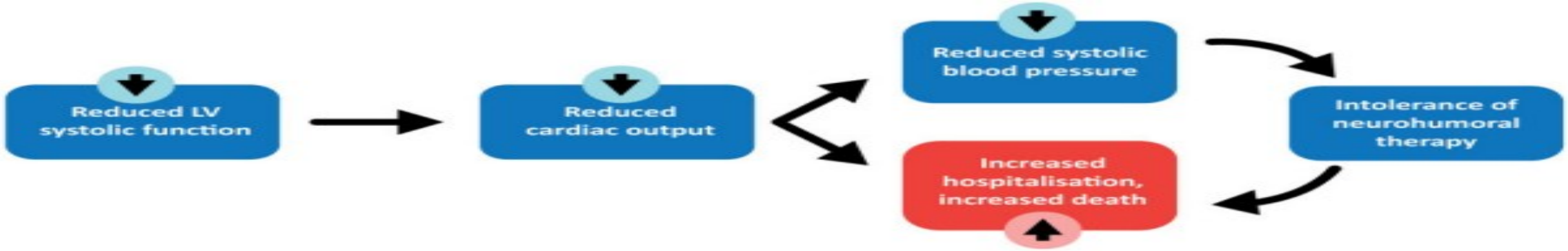
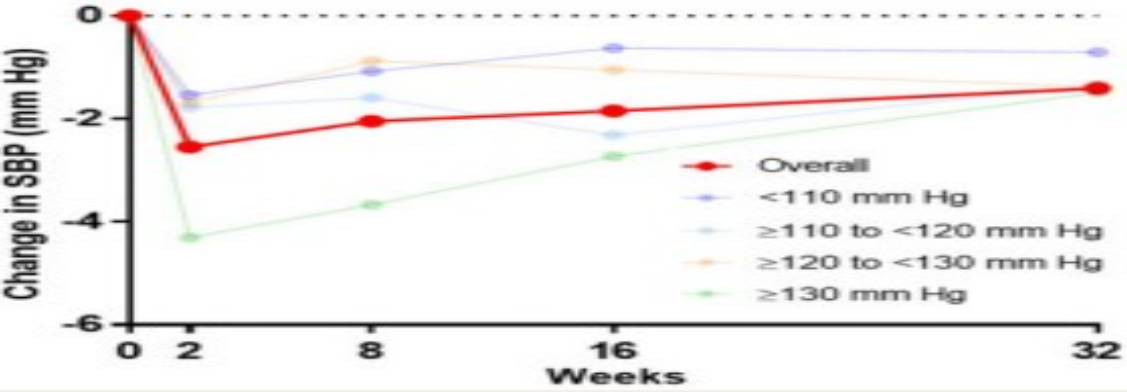
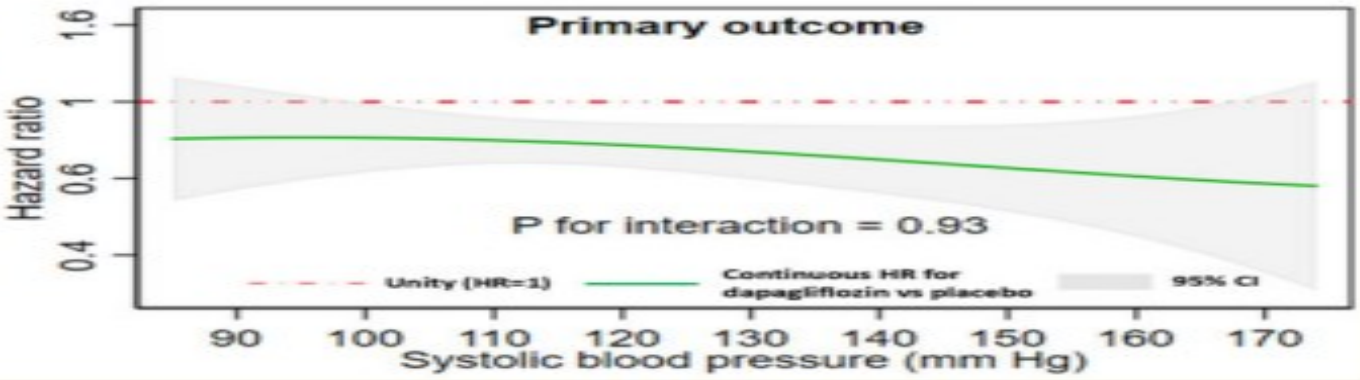


ESC European Society of Cardiology
European Heart Journal (2020) **41**, 3402–3418
doi:10.1093/eurheartj/ehaa496

Effect of dapagliflozin according to baseline systolic blood pressure in the Dapagliflozin and Prevention of Adverse Outcomes in Heart Failure trial (DAPA-HF)







Cardiol Ther (2021) 10:9–25
https://doi.org/10.1007/s40119-020-00203-5

REVIEW

Contemporary Strategies to Manage High Blood Pressure in Patients with Coexistent Resistant Hypertension and Heart Failure With Reduced Ejection Fraction

Treatment algorithm for a patient with coexisting resistant hypertension and heart failure with reduced ejection fraction

Step 1

Non-pharmacological/Lifestyle

- <2300 mg of sodium daily
- Healthy dietary patterns (*consult registered dietician*)
- Prescribe Individualized Exercise Training (*cardiac rehabilitation if LVEF ≤35%*)
- >6 hours of uninterrupted sleep
- Weight loss
- Tobacco and alcohol cessation

Diuretic choice

- Maximize dose of thiazide-type diuretic (preferably chlorthalidone or indapamide)
- Add loop diuretic as needed for volume management
- If eGFR < 30, thiazide-type diuretic less predictable BP reduction, reserve for refractory edema / volume

Renin-angiotensin blocker choice

- Attempt to maximize dose of angiotensin-neprilysin inhibitor (i.e. sacubitril/valsartan)
- If use of ARNI not possible, use longer acting and more effective ARB, examples include azilsartan (only combination ARB with chlothalidone), telmisartan, olmesartan, irbesartan

Beta-blocker choice

- Carvedilol is best choice given its established mortality benefits in HF with additional BP lowering effects.
- Avoid metabolically adverse beta-blockers such as metoprolol tartrate (GEMINI)

Step 2

Add a mineralocorticoid receptor antagonist

- Spironolactone used most commonly because of PATHWAY2 trial data and availability
- Eplerenone shows similar efficacy with less androgenic side effects
- **If limited by hyperkalemia, particularly in CKD, consider addition of a potassium binder**
- Clear data for efficacy in HFrEF (LVEF ≤ 35%, RALES/EMPHASIS/EPHESUS)

Addition of a SGLT2 inhibitor

- Significant BP lowering in nocturnal hypertension, diabetes mellitus and high salt sensitivity
- CV risk reduction in HFrEF even without diabetes mellitus (DAPA-HF, EMPEROR-Reduced)

Step 3

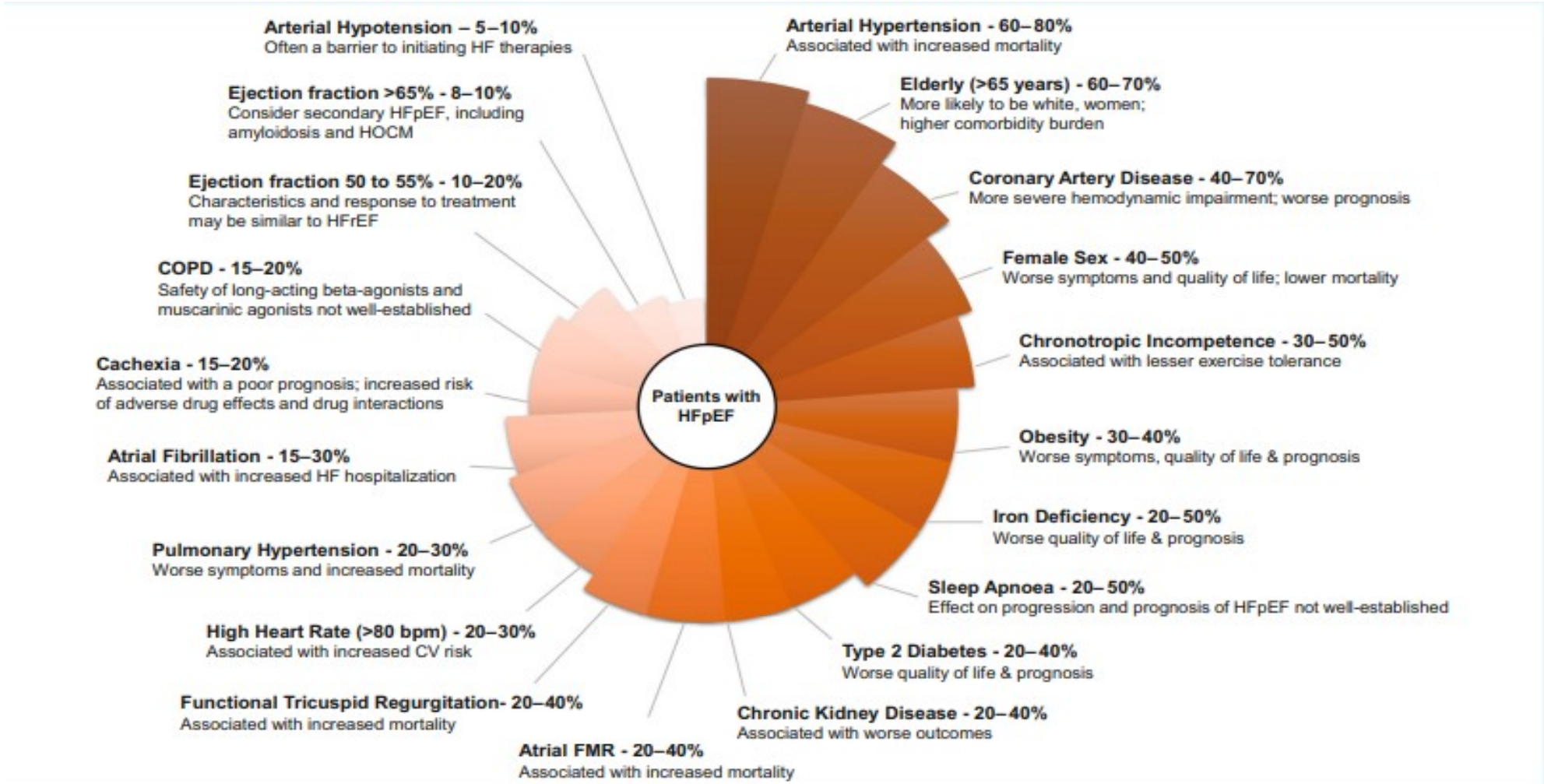
Add hydralazine plus a nitrate and /or dihydropyridine calcium channel blocker

- **Avoid non-dihydropydine CCBs**
- Preferentially use 2nd generation dihydropyridine CCBs (examples include amlodipine and felodipine, PRAISE 1/2, V-HeFT III)
- Hydralazine plus nitrates can be considered, however 3x daily dosing results in less adherence
- Avoid alpha-blockers or pure vasodilators such as minoxidil

Patient profiling in heart failure for tailoring medical therapy. A consensus document of the Heart Failure Association of the European Society of Cardiology

European Journal of
Heart Failure

Patient Phenotype Profiling in Heart Failure with Preserved Ejection Fraction to Guide Therapeutic Decision Making A Scientific Statement of the Heart Failure Association (HFA) and the European Heart Rhythm Association (EHRA) of the ESC, and the European Society of Hypertension (ESH)



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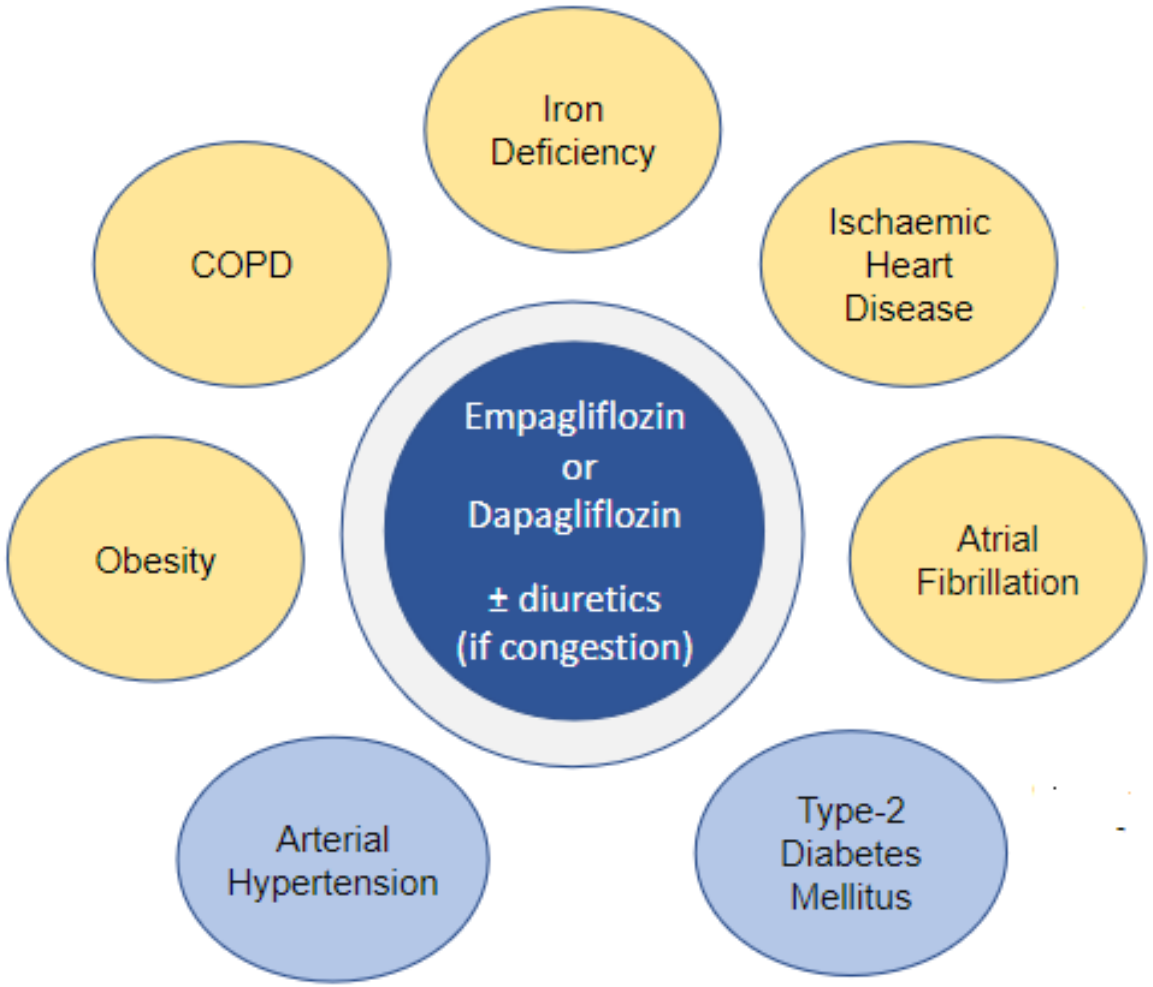

2023 ESH Guidelines for the management of arterial hypertension

The Task Force for the management of arterial hypertension of the European Society of Hypertension

Treatment of hypertension in heart failure with preserved ejection fraction (HFpEF)

Recommendations and statements	CoR	LoE
Treatment of hypertension with all major antihypertensive drug classes (ACEis or ARBs, BBs, CCBs, and Thiazide/Thiazide-like diuretics) is recommended in patients with HFpEF.	I	A
SGLT2is are recommended independently from the presence of type 2 diabetes.	I	A
Substitution of a RAS-inhibitor by an ARNI (sacubitril/valsartan) can be considered, particularly in the lower HFpEF spectrum.	II	B
Treatment with a MRA (spironolactone) regardless of diagnosed true resistant hypertension can be considered, particularly in the lower HFpEF spectrum.	II	B

2023 ESH Guidelines for the management of arterial hypertension

The Task Force for the management of arterial hypertension of the European Society of Hypertension

Recommendations and statements	CoR	LoE
In patients 18 to 79 years, the recommended office threshold for initiation of drug treatment is 140 mmHg for SBP and/or 90 mmHg for DBP.	I	A
In patients ≥80 years, the recommended office SBP threshold for initiation of drug treatment is 160 mmHg.	I	B
However, in patients ≥80 years a lower SBP threshold in the range 140 – 159 mmHg may be considered.	II	C
The office SBP and DBP thresholds for initiation of drug treatment in frail patients should be individualized.	I	C
In adult patients with a history of CVD, predominantly CAD, drug treatment should be initiated in the high-normal BP range (SBP ≥130 or DBP ≥80 mmHg).	I	A

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Established cardiovascular and kidney disease

- Cerebrovascular disease: ischemic stroke, cerebral hemorrhage, TIA
- Coronary artery disease: myocardial infarction, angina, myocardial revascularization
- Presence of hemodynamically significant atheromatous plaque (stenosis) on imaging
- Heart failure, including heart failure with preserved ejection fraction
- Peripheral artery disease
- Atrial fibrillation
- Severe albuminuria > 300 mg/24 h or ACR (preferably in morning urine) >300 mg/g
- CKD stage 4 and 5, eGFR < 30 mL/min/1.73m^2

Hypertension disease staging	Other risk factors, HMOD, CVD or CKD	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 DBP ≥ 110
Stage 1	No other risk factors[a]	Low risk	Low risk	Moderate risk	High risk
	1 or 2 risk factors	Low risk	Moderate risk	Moderate to high risk	High risk
	≥3 risk factors	Low to moderate risk	Moderate to high risk	High risk	High risk
Stage 2	HMOD, CKD grade 3, or diabetes mellitus	Moderate to high risk	High risk	High risk	Very high risk
Stage 3	Established CVD or CKD grade ≥4	Very high risk	Very high risk	Very high risk	Very high risk

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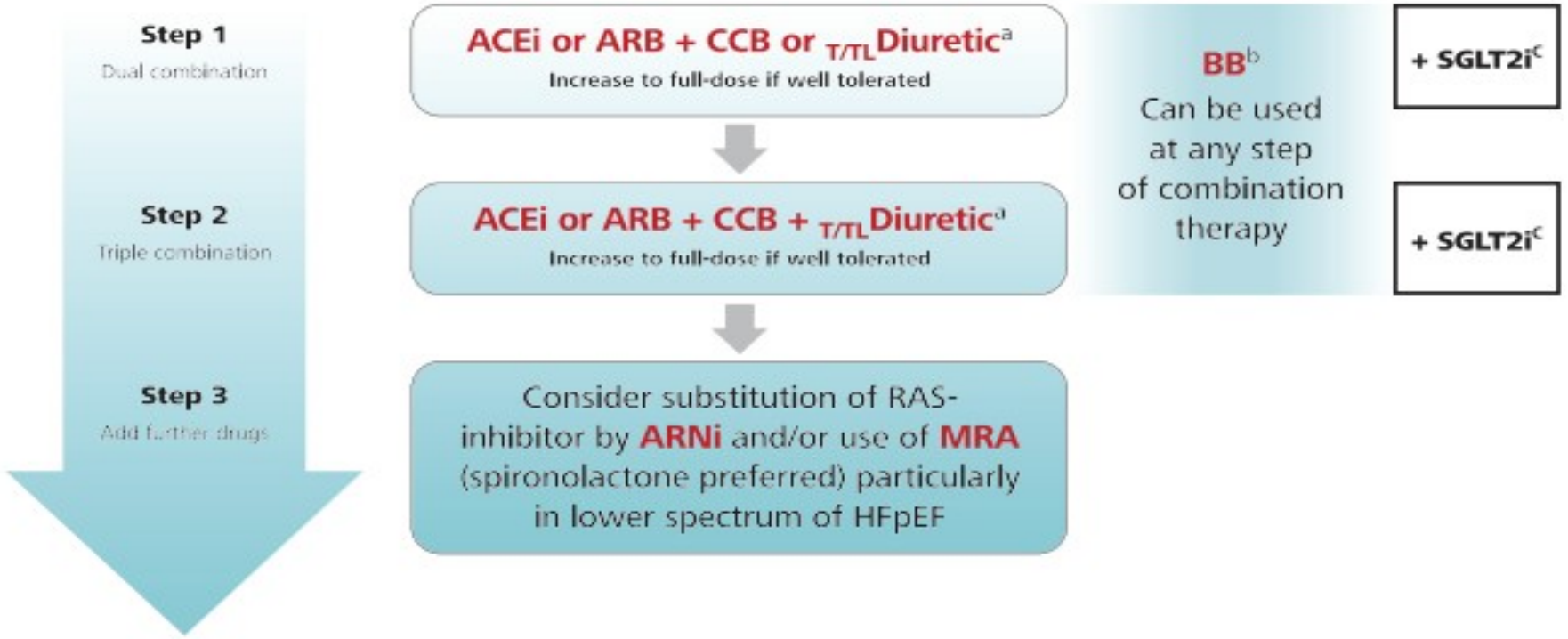

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Recommendations and statements	CoR	LoE
Patients 18 to 64 years old		
The goal is to lower office BP to <130/80mmHg.	I	A
Patients 65 to 79 years old		
The primary goal of treatment is to lower BP to <140/80mmHg.	I	A
However, lowering BP to below 130/80mmHg can be considered if treatment is well tolerated.	II	B

ΣΑΣ ΕΥΧΑΡΙΣΤΩ