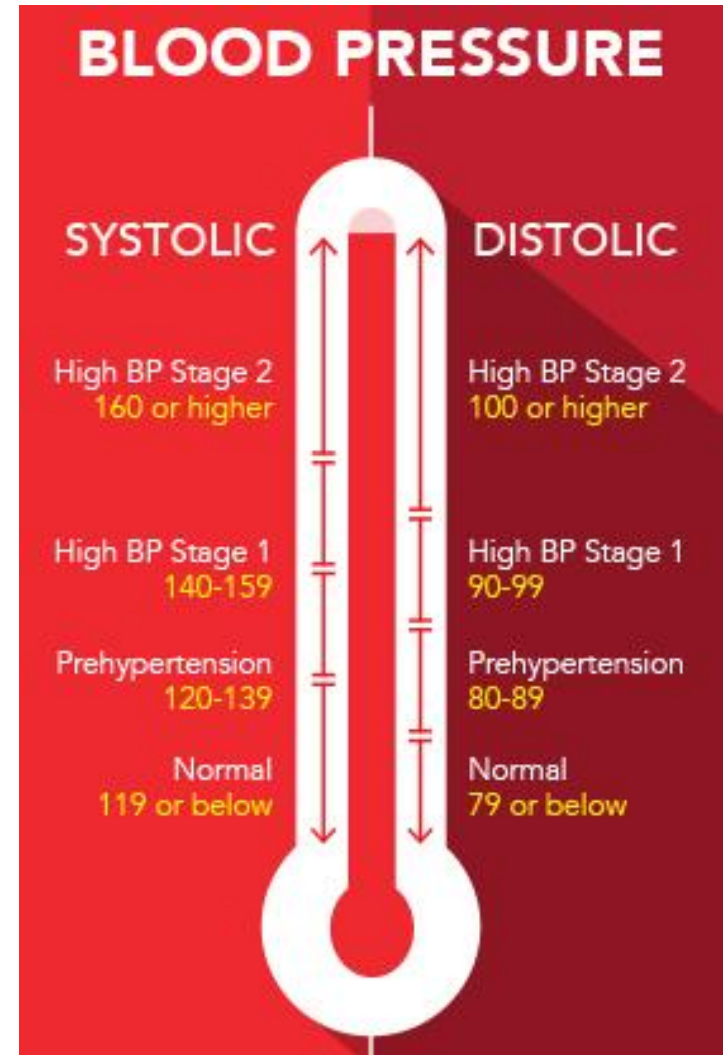




Hypertension: The Silent Killer!

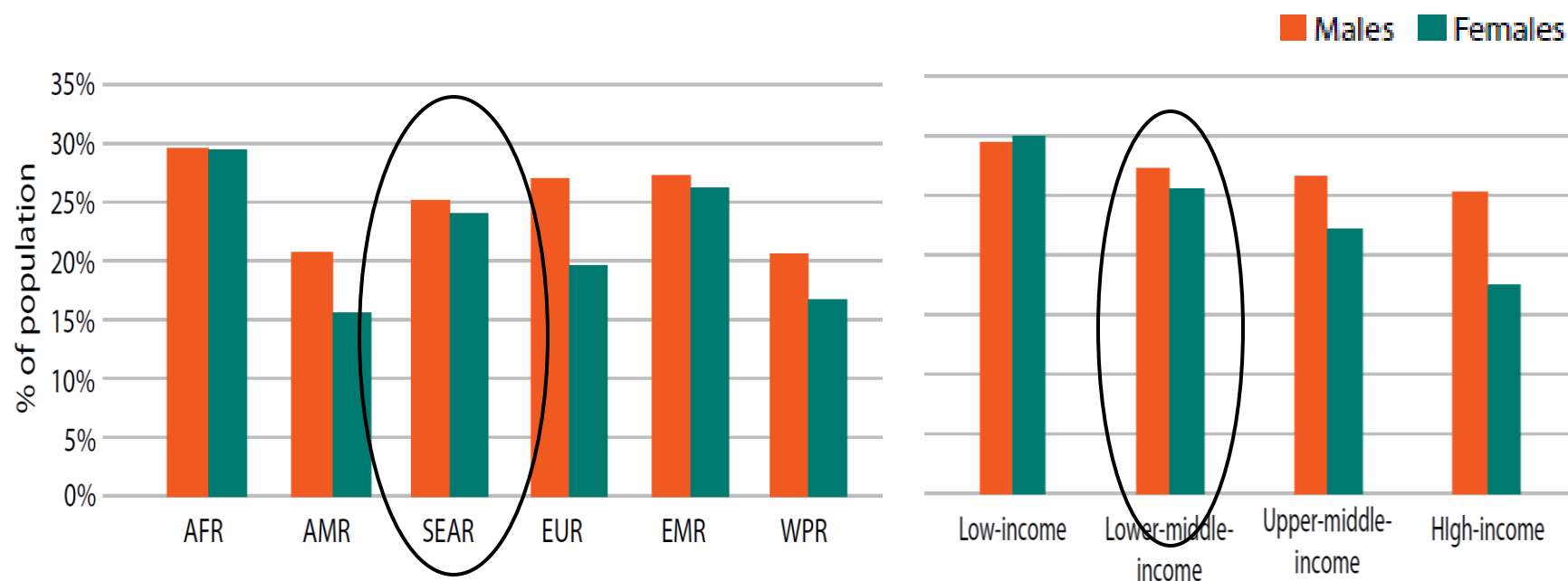
Hypertension Burden

- One of the major contributors of CV morbidity and mortality
- Undiagnosed, uncontrolled, and undertreated hypertension - responsible for increased chronic disease burden
- Worldwide Prevalence: 970 million
- Expected to affect 1.56 billion adults with hypertension by 2025



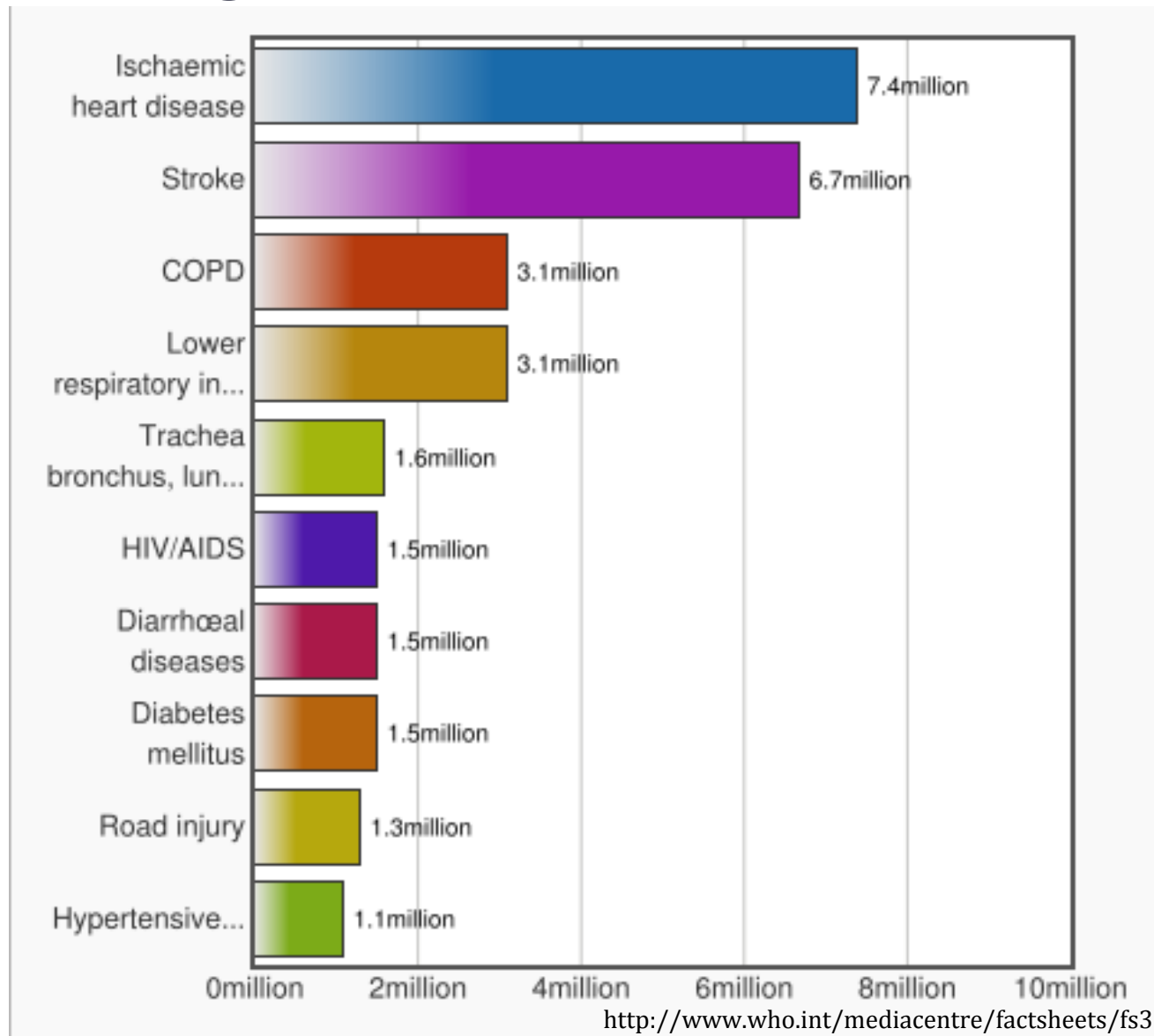
Hypertension: WHO Estimates

- The global prevalence is $\approx 22\%$.



AFR=African Region, AMR=Region of the Americas, SEAR =South-East Asia Region, EUR=European Region, EMR=Eastern Mediterranean Region, WPR=Western Pacific Region

Leading caused of Death: WHO Data



Worldwide, 3 in 10 deaths are caused by CVD and half of all CVD deaths are caused by hypertension:

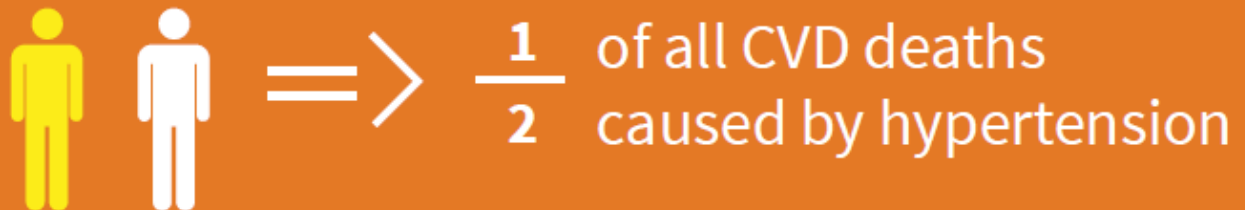
56m deaths
worldwide



17.5m deaths
due to CVD



9.4m deaths due
to hypertension



Get The Pressure Down!!

51%

Of Deaths
from Stroke

45%

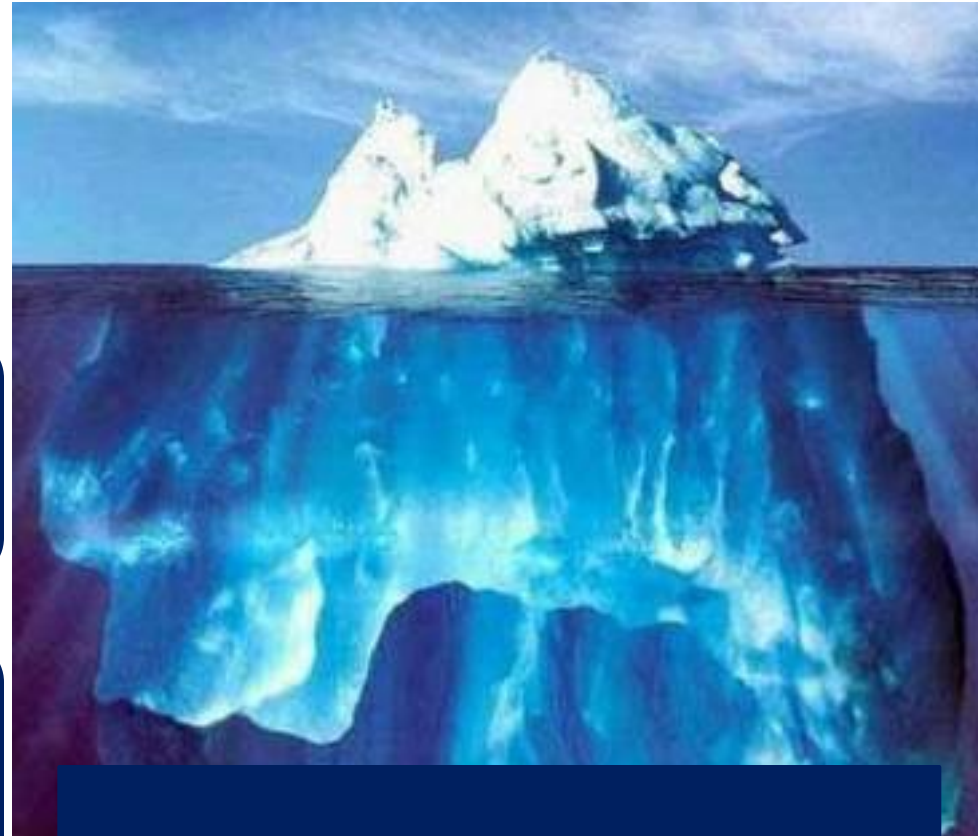
Of Deaths
from Coronary
Heart Disease

9.4 million

Deaths due to
HT

13%

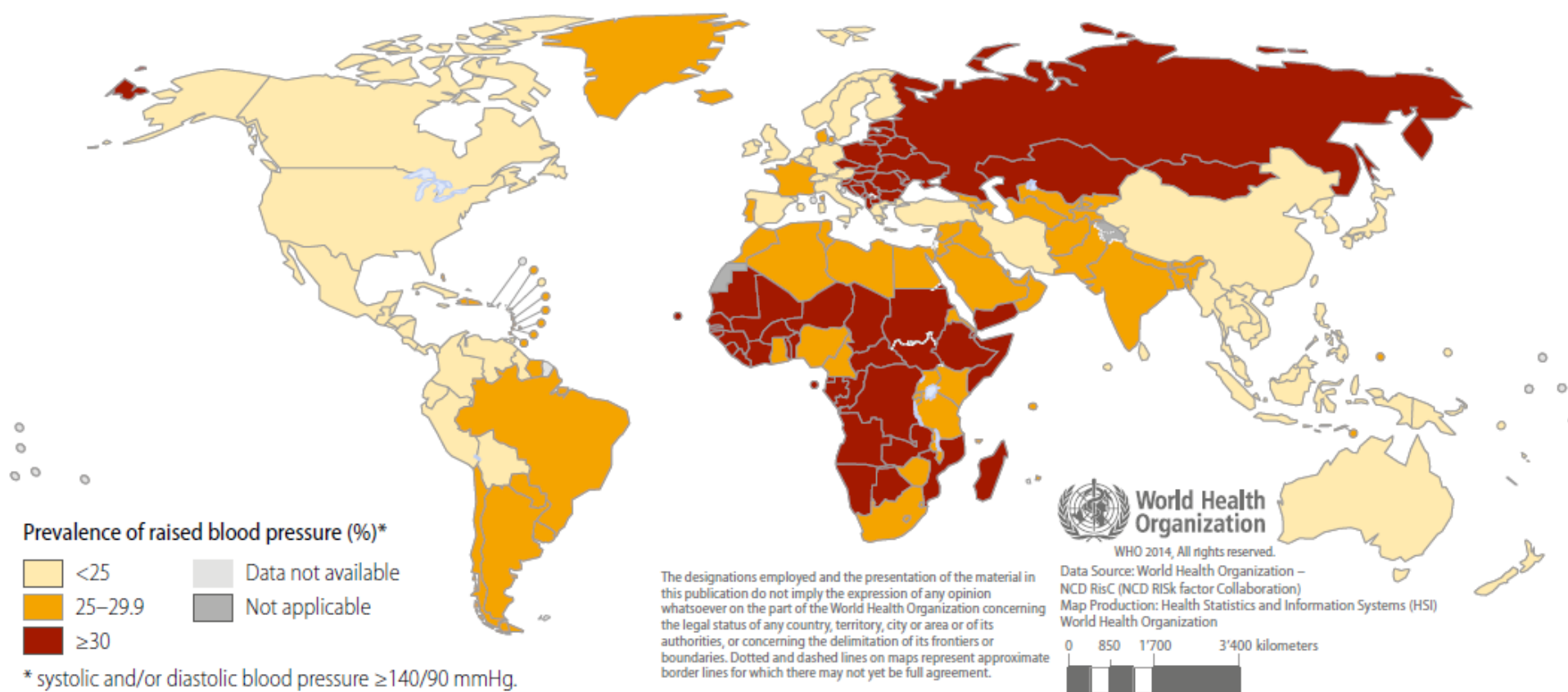
Total global
deaths



**Hypertension :
The Silent Killer**

Prevalence of Hypertension in India

Fig. 6.1 Age-standardized prevalence of raised blood pressure in males aged 18 years and over (defined as systolic and/or diastolic blood pressure equal to or above 140/90 mm Hg), comparable estimates, 2014



Hypertension In India

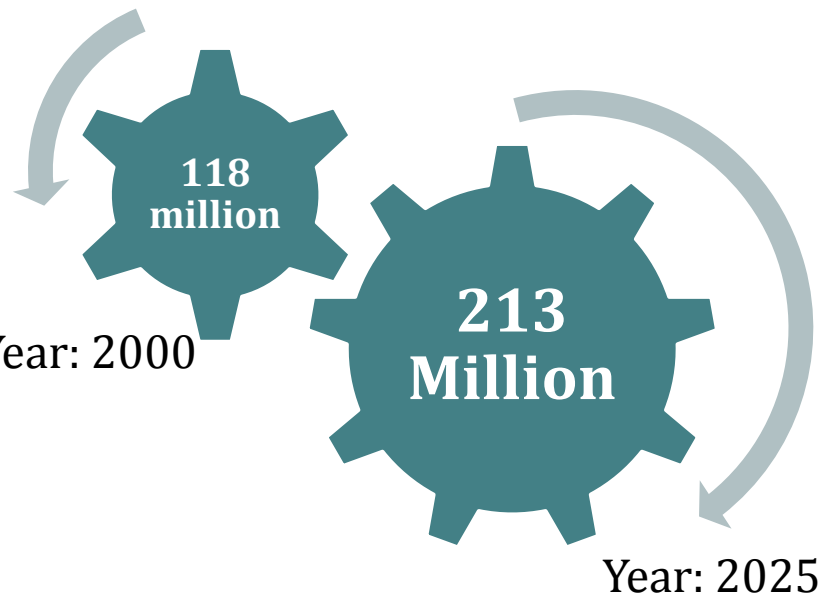
- Responsible for

57%

- of all stroke deaths

24%

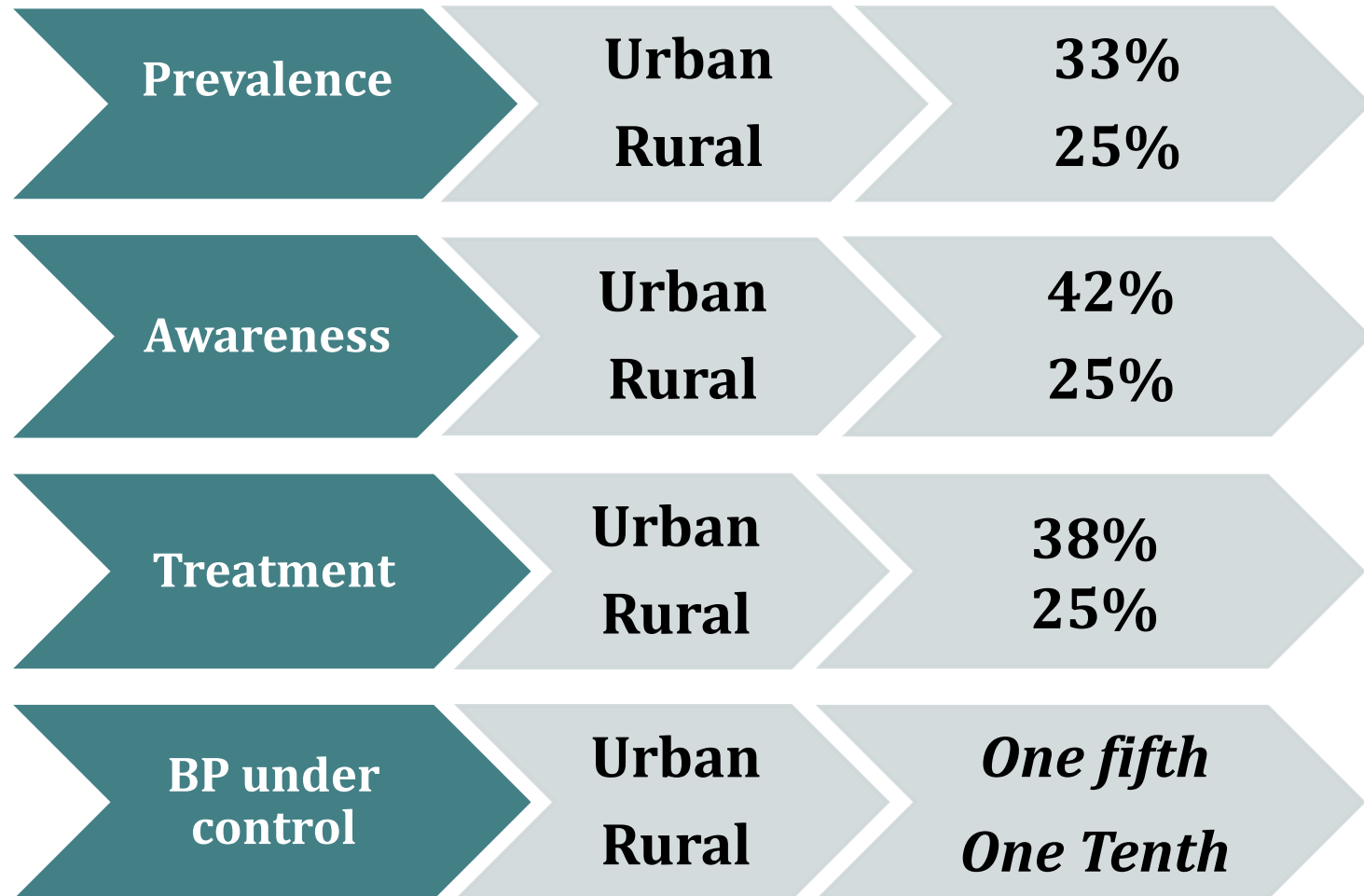
- all deaths due to CHD



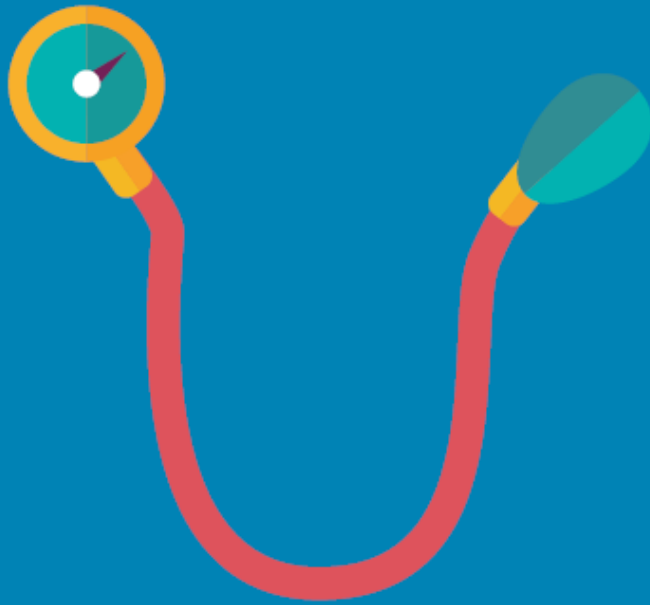
Incidence of hypertension is expected to almost double to 213 million by 2025 in India

Hypertension In India

A meta-analysis by Anchala, *et al.* which included 142 articles from the year 1950 to 2013.



Global Adherence



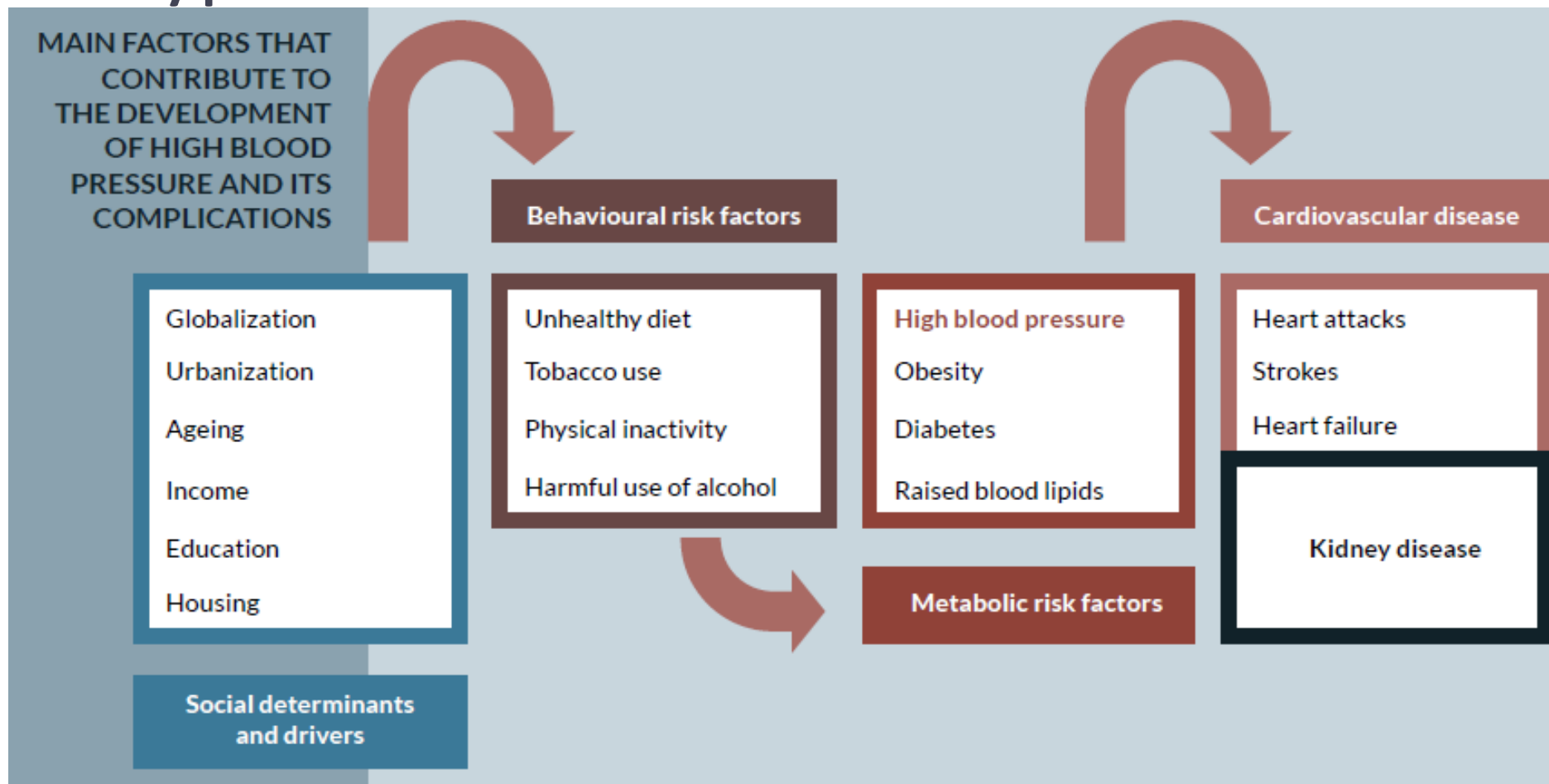
Only 1 in 7 people with raised blood pressure have it adequately controlled

1 in 4 patients on anti-hypertensives are not taking prescribed medicines



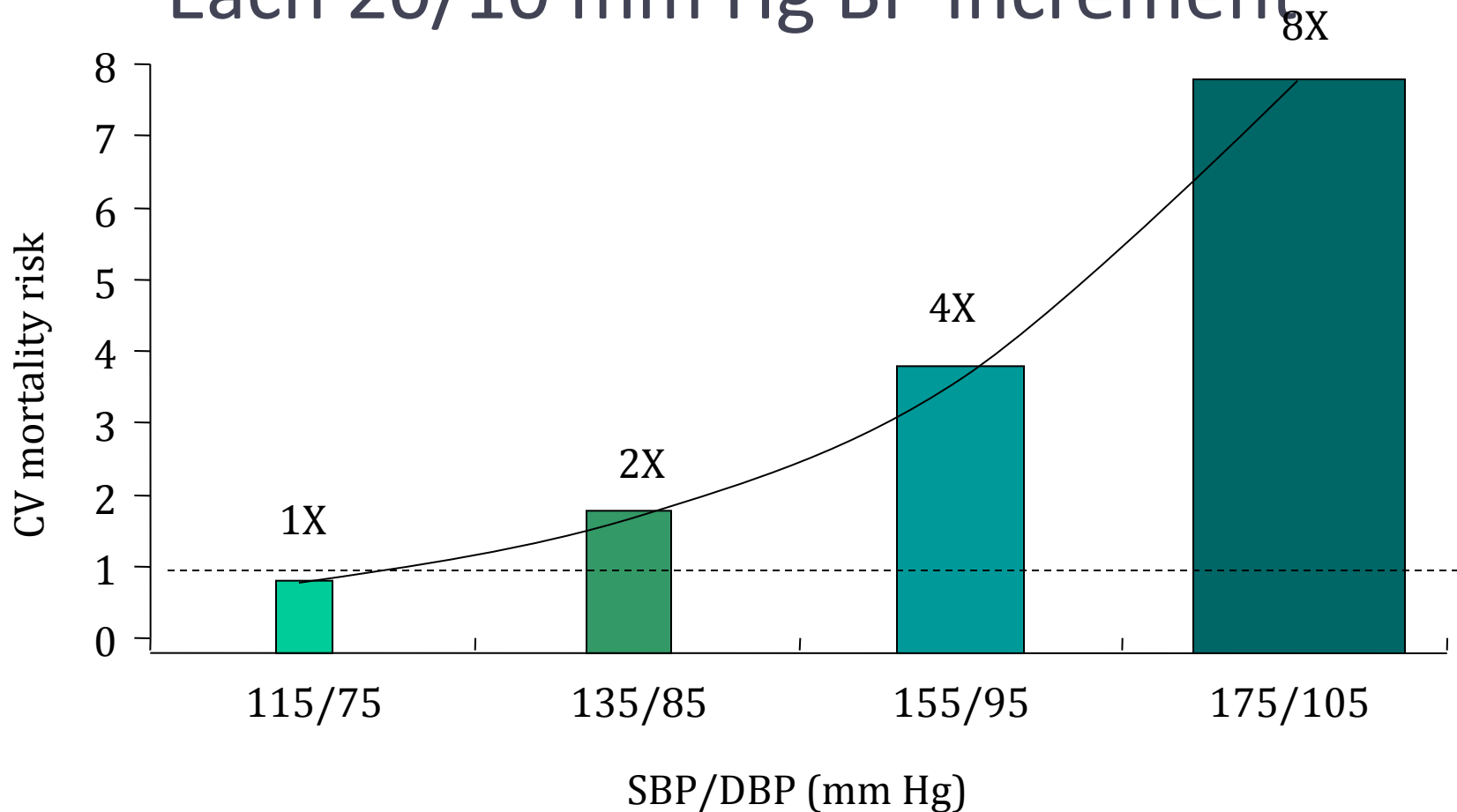
Uncontrolled Hypertension

Hypertension Risk Factors



Hypertension is a polygenic disease involving a major contribution of various factors

CV Mortality Risk Doubles With Each 20/10 mm Hg BP Increment



Silent Killer

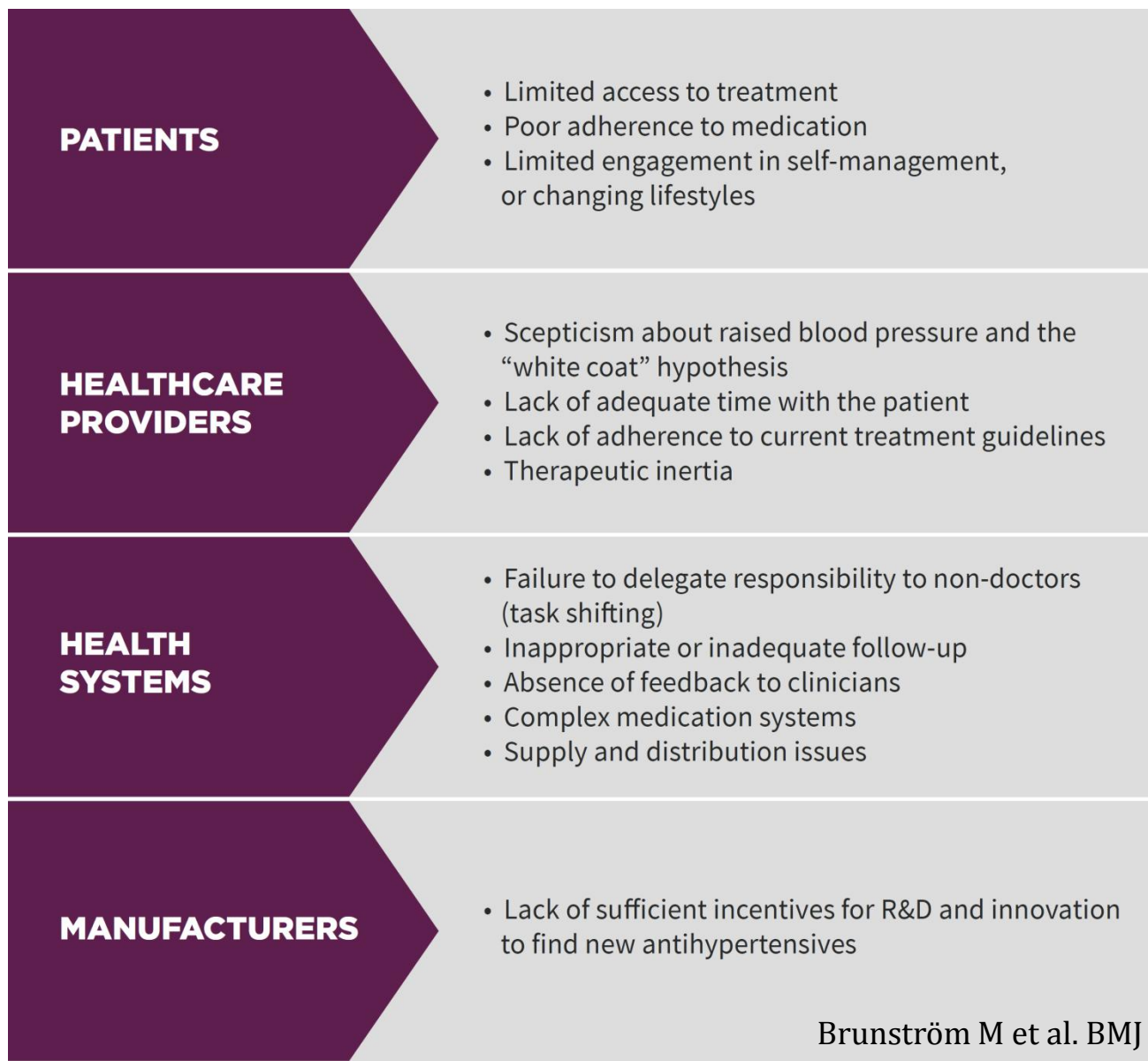
- Despite compelling evidence that hypertension is a public health concern that we cannot ignore, it often fails to attract significant attention.
- Known as the “silent killer”, hypertension rarely causes symptoms and many people go undiagnosed for years, with few, if any symptoms of discomfort

Current Challenges in Hypertension Control

- Majority of the physicians attribute poor patient compliance to poor control.
- Most patients claim to be compliant and blame the lack of efficacy and side effects.
- Most often, physicians fail to act when patients do not achieve their targets.

Uncontrolled hypertension is due to an interplay of many factors including patient, physician, lifestyle, and diet-related factors.

The multi-dimensional barriers to blood pressure control

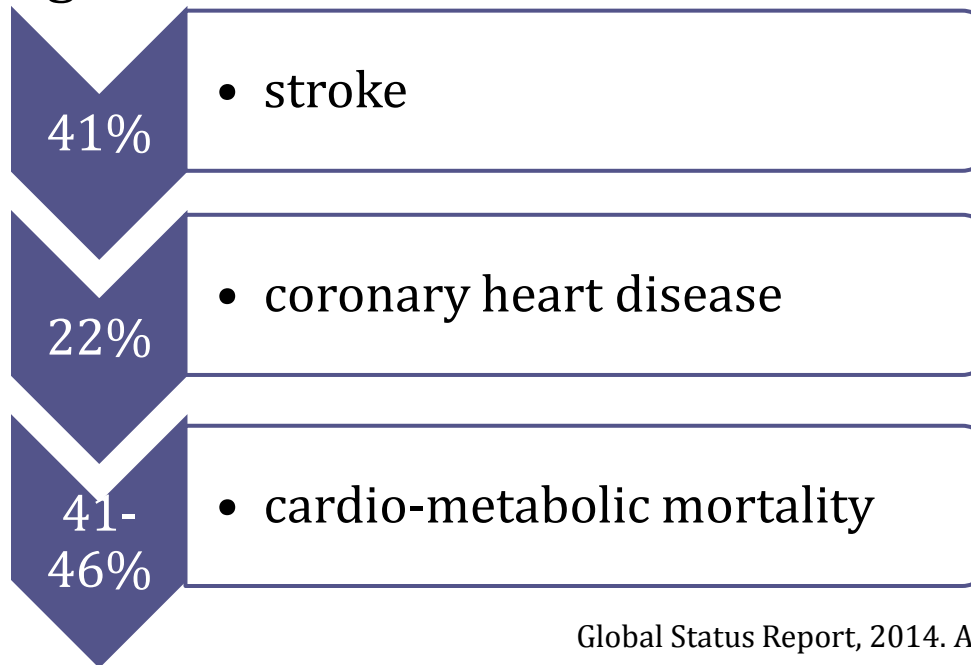


Hypertension

Early and Intensive Intervention

Early Intervention

- The WHO 2014 report stresses on early detection and effective management in minimizing the risk of heart attacks, heart failure, stroke, and kidney failure.
- A 10 mmHg reduction in BP reduces the risk:



How can high blood pressure be prevented?

High blood pressure is both preventable and treatable. The chances of developing high blood pressure and its adverse consequences can be minimized by making healthy choices about:

Diet

- Adopting a healthy lifestyle throughout the life course with emphasis on balanced nutrition.
- Eating five servings of fruit and vegetables every day.
- Decreasing saturated and total fat intake, such as by eating low-fat products.



Salt

- Reducing salt intake; consuming less than 5 grams of salt per day from all sources.

Physical activity

- Doing regular physical activity. WHO recommends physical activity for at least 30 minutes each day.

Alcohol

- Avoiding harmful use of alcohol.

Tobacco

- Stopping tobacco use and exposure to second-hand smoke.

Others

- Effective management of stress.

Cardiovascular disease

Heart attacks
Strokes
Heart failure
Kidney disease

Metabolic risk factors

High blood pressure
Obesity
Diabetes
Raised blood lipids

Behavioural risk factors

Unhealthy diet
Tobacco use
Physical inactivity
Harmful use of alcohol

Social determinants and drivers

Globalization
Urbanization
Ageing
Income
Education
Housing

Main factors contributing to high blood pressure and its consequences

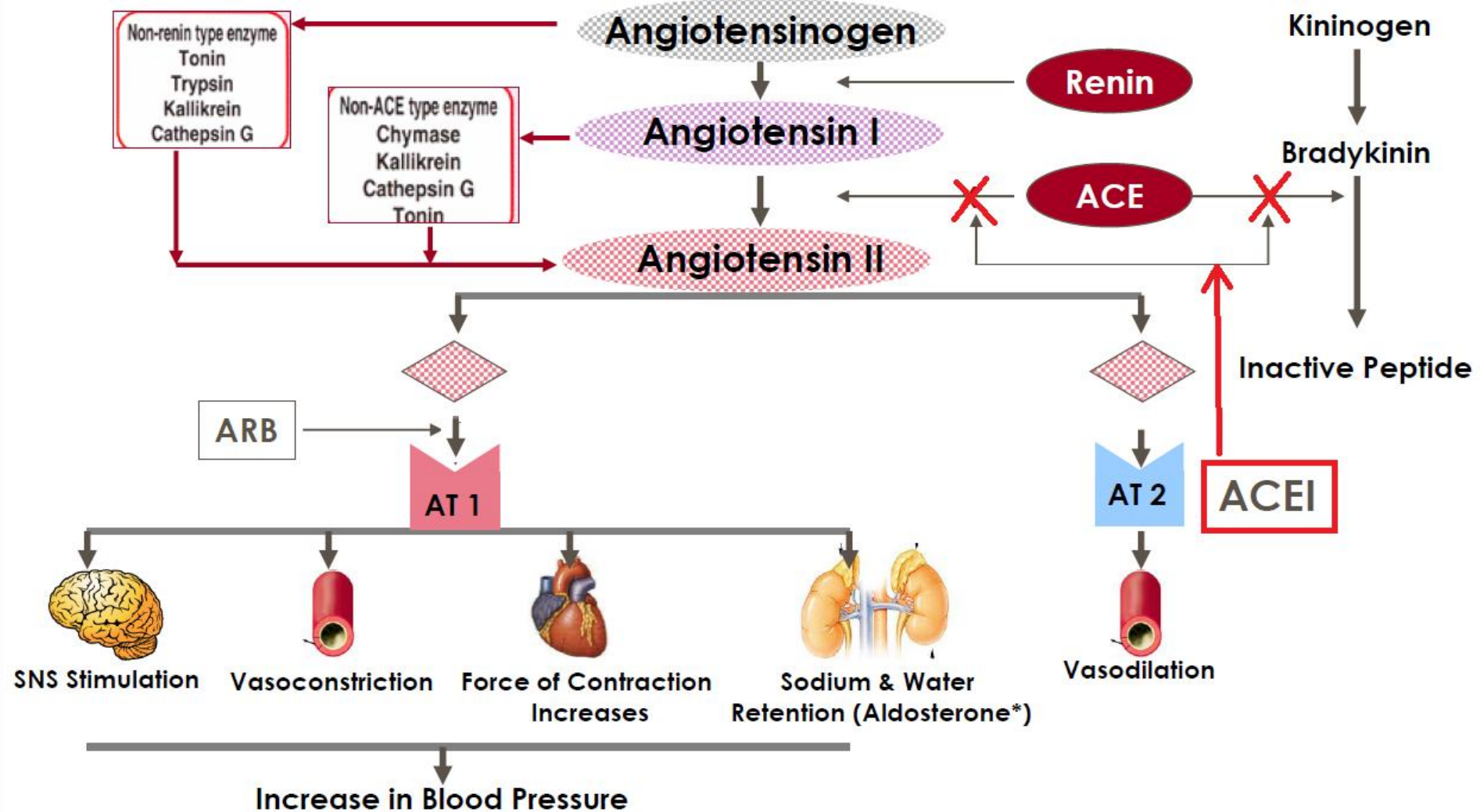
Common anti-hypertensive drugs

- Angiotensin receptor blockers
- Angiotensin-converting enzyme inhibitors
- Calcium channel blockers
- Diuretics
- Beta adrenergic blocking agents
- Alpha Adrenergic Blockers

Angiotensin - converting enzyme (ACE) Inhibitors

- Drugs that target the renin-angiotensin system ACE inhibitors:
 - Benazepril
 - Captopril
 - Enalapril
 - Fosinopril
 - Lisinopril
 - Perindopril
 - Quinapril
 - Ramipril
 - Trandolapril

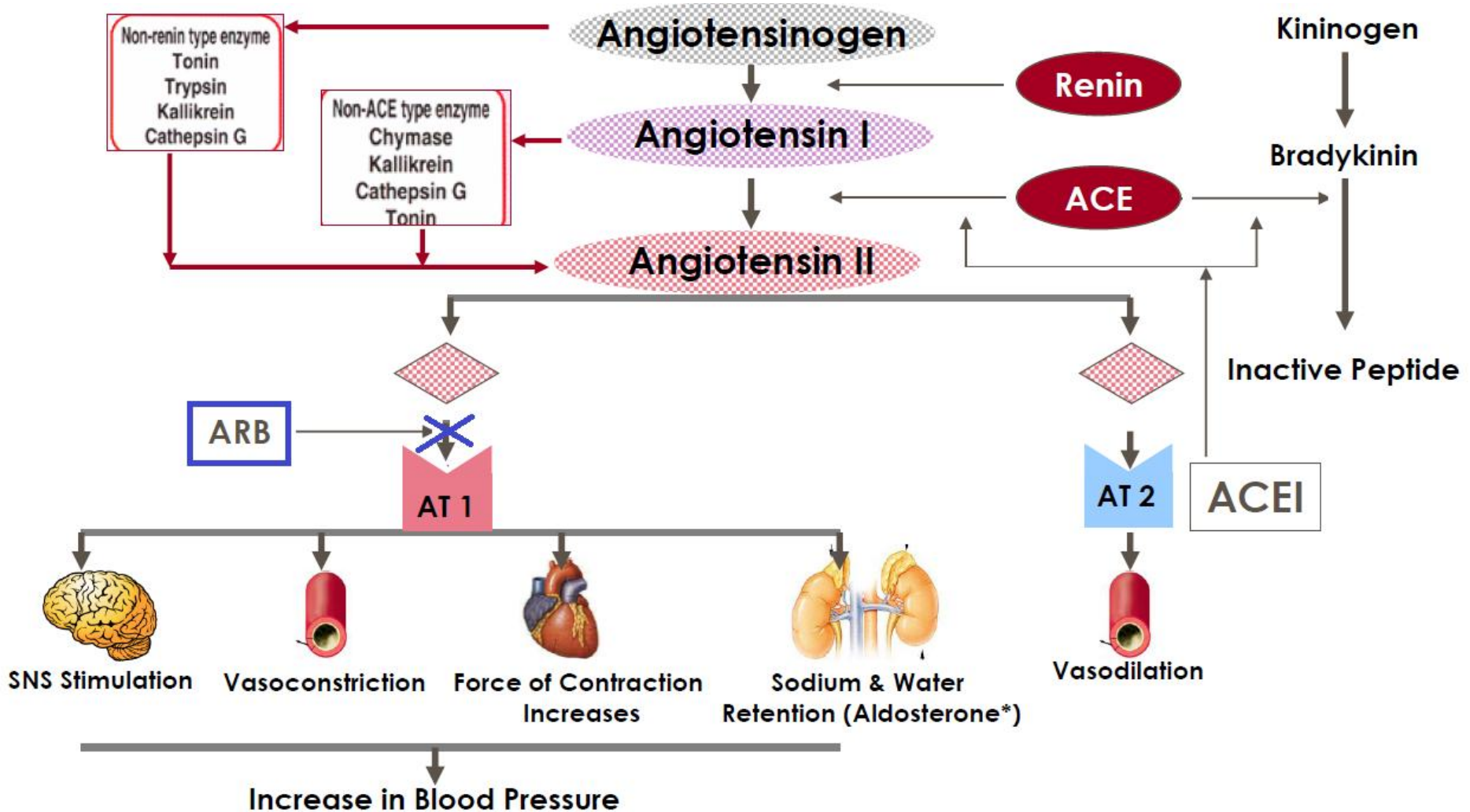
ANGIOTENSIN - CONVERTING ENZYME (ACE) INHIBITORS



Angiotensin receptor blockers

- Azilsartan
- Candesartan
- Eprosartan
- Irbesartan
- Losartan
- Olmesartan
- Telmisartan
- Valsartan

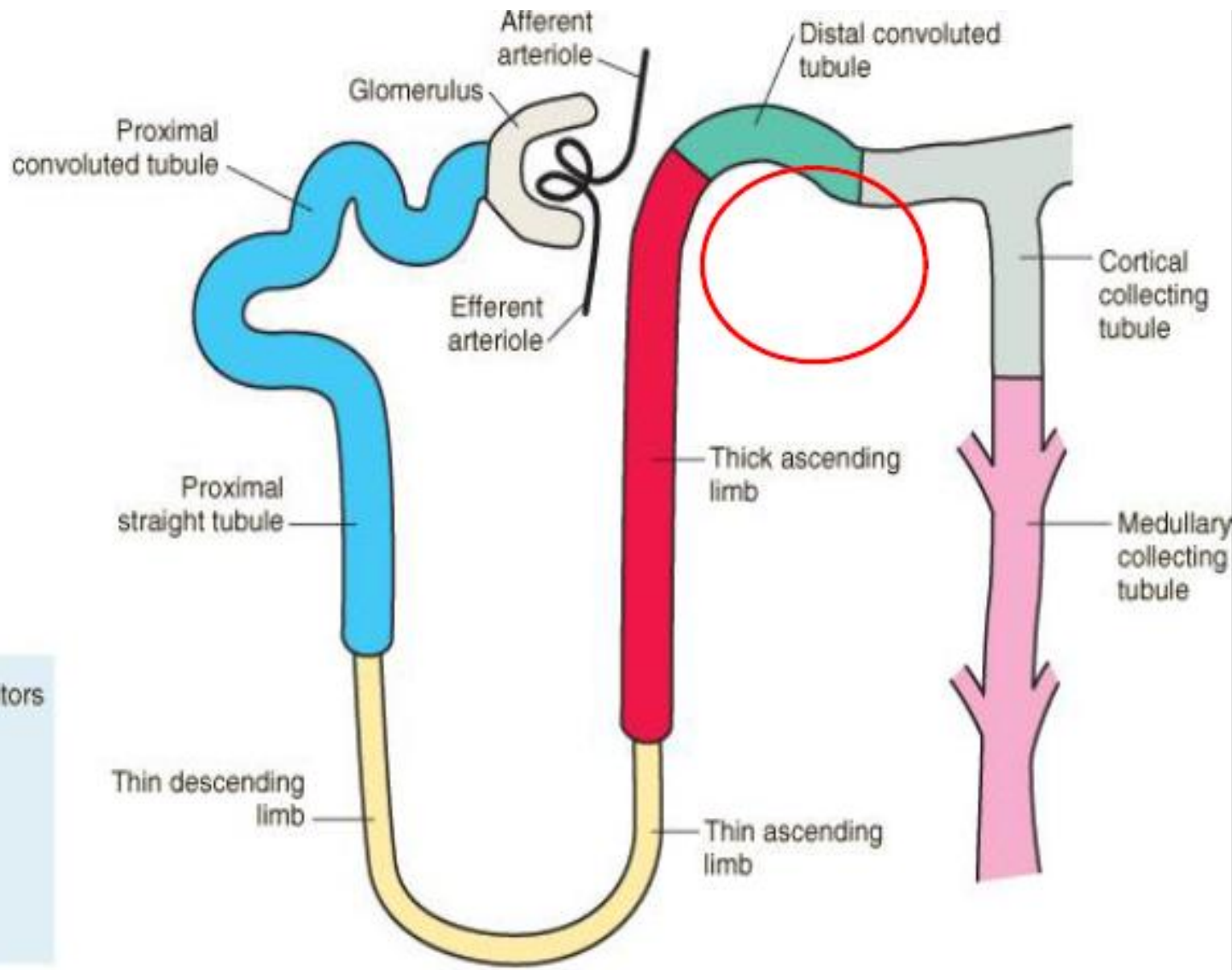
ANGIOTENSIN RECEPTOR BLOCKERS



diuretics

- Thiazide and thiazide-like diuretics
 - Bendroflumethiazide
 - Chlorthalidone
 - Hydrochlorothiazide
 - Indapamide
- Loop diuretics
 - Bumetanide
 - Furosemide
 - Torsemide
- Potassium-sparing diuretics
 - Amiloride
 - Eplerenone
 - Spironolactone
 - Triamterene

Nephron sites of action of diuretics



Site of diuretic action

-  Carbonic anhydrase inhibitors
-  Osmotic diuretics
-  Loop diuretics
-  Thiazide diuretics
-  K^+ -sparing diuretics

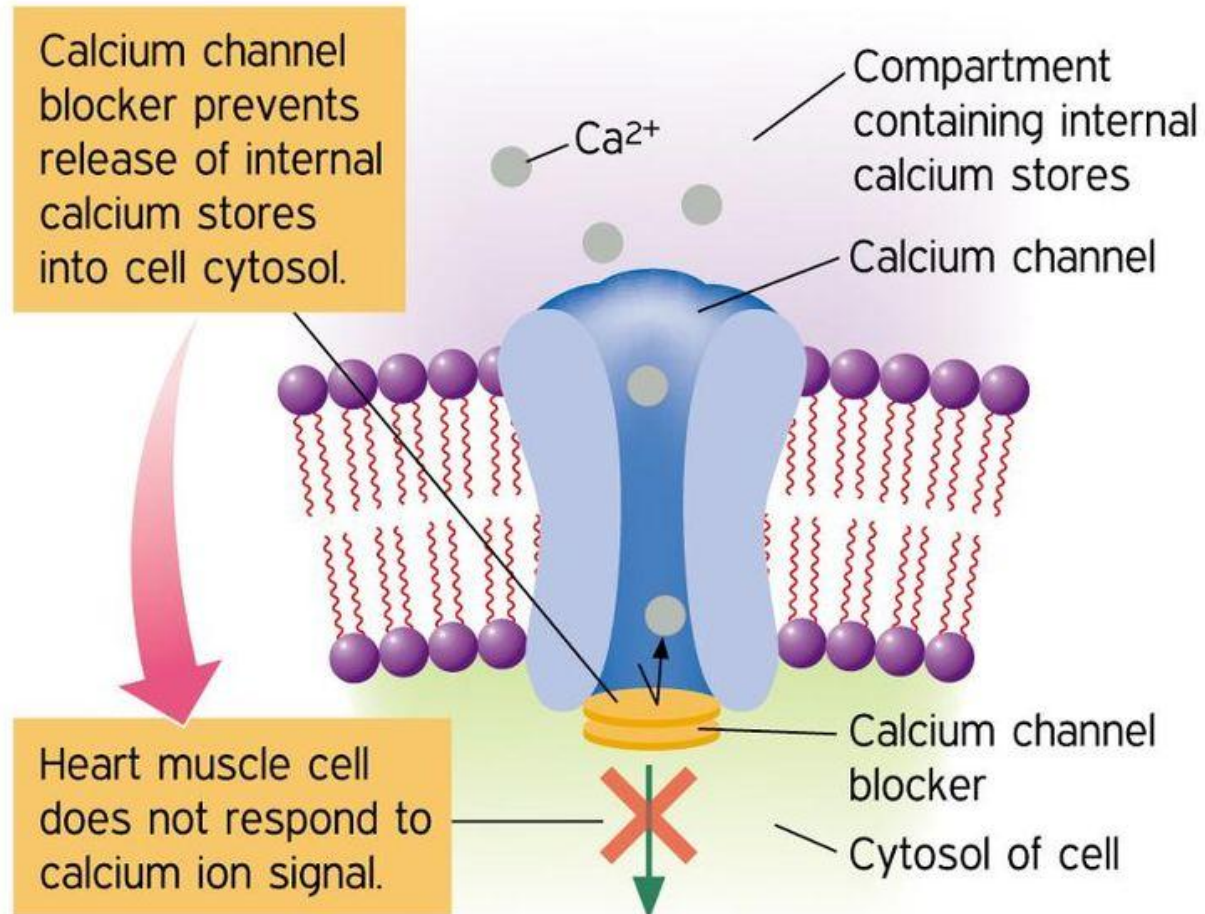
Calcium channel blockers

- Nondihydropyridines

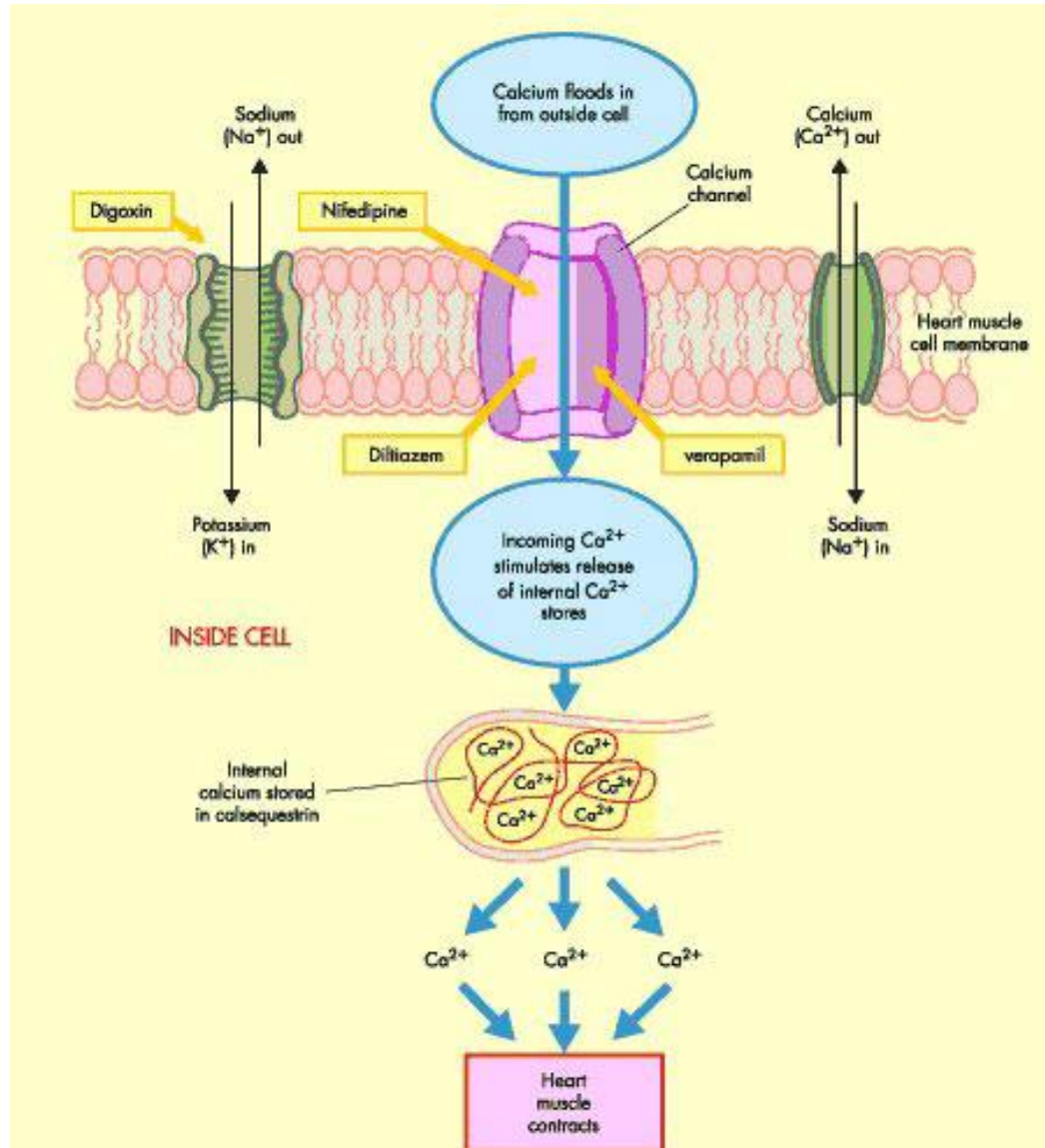
- Diltiazem
- Verapamil

- Dihydropyridines

- Amlodipine
- Felodipine
- Isradipine
- Nifedipine
- Nitrendipine



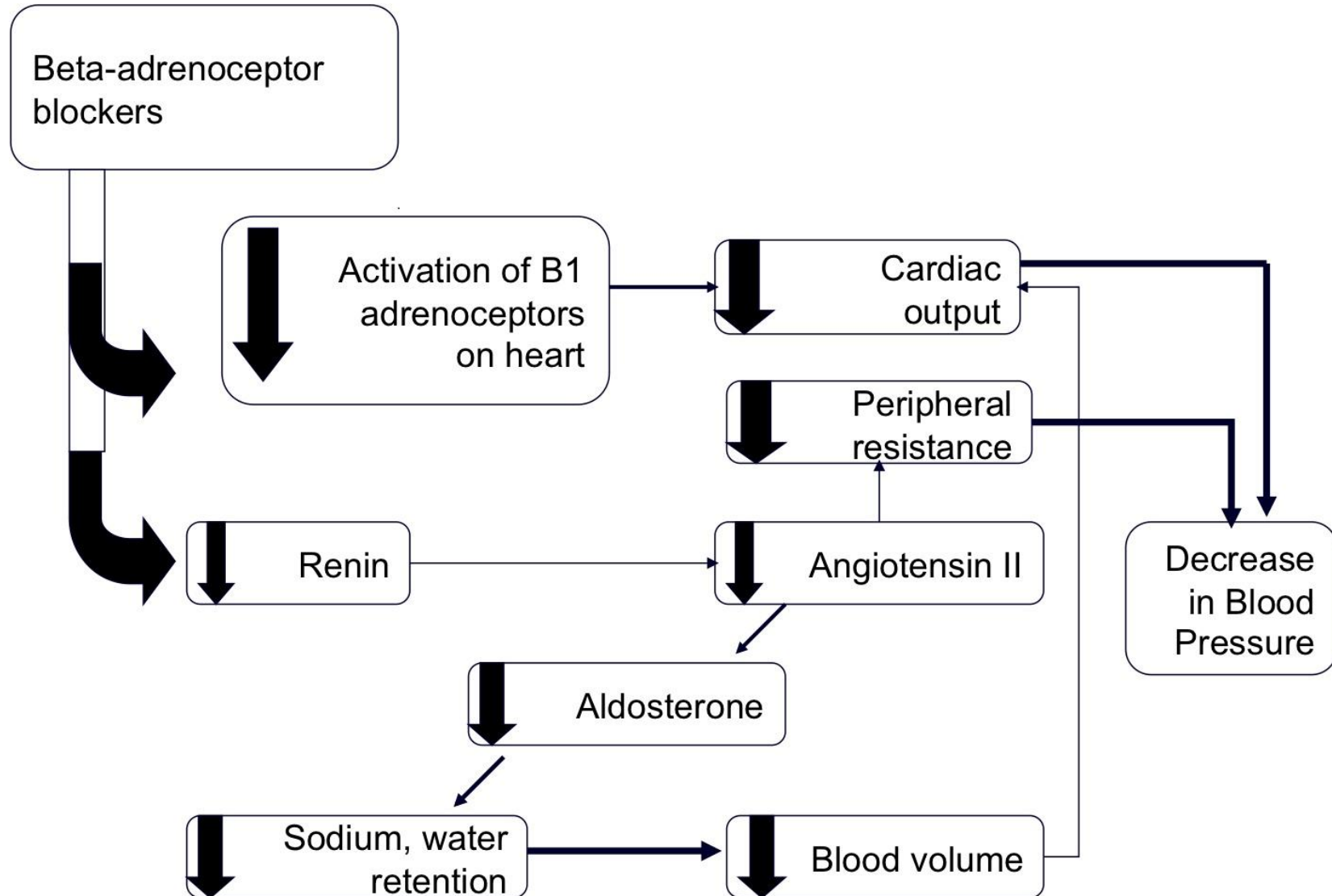
CALCIUM CHANNEL BLOCKERS



Beta Blockers

- Acebutalol
- Atenolol
- Bisoprolol
- Carvedilol
- Labetalol
- Metoprolol succinate
- Metoprolol tartrate
- Nadolol
- Nebivolol
- Propranolol

Beta Blockers



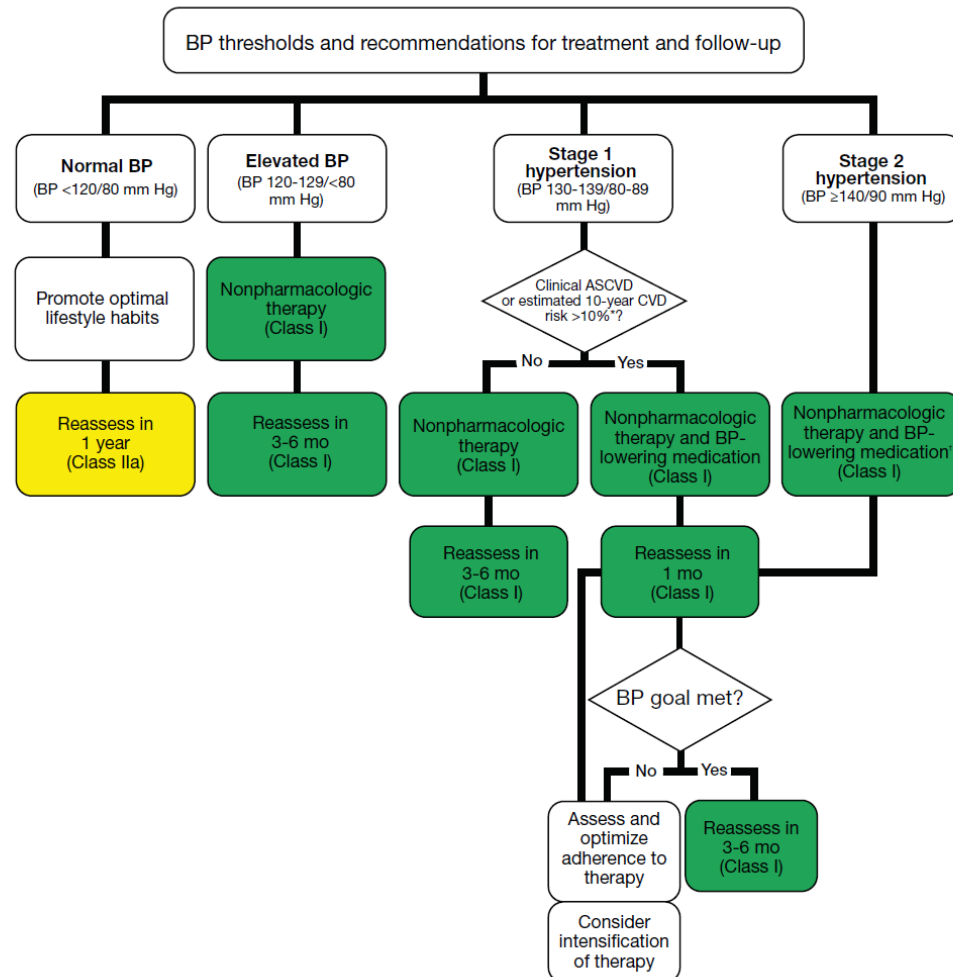
Hypertension

Guidelines

2017 ACC/ AHA Hypertension Guidelines

BP Category	Systolic BP		Diastolic BP	Treatment or Follow-up
Normal	<120 mm Hg	and	<80 mm Hg	Evaluate yearly; encourage healthy lifestyle changes to maintain normal BP
Elevated	120-129 mm Hg	and	<80 mm Hg	Recommend healthy lifestyle changes and reassess in 3-6 months
Hypertension: stage 1	130-139 mm Hg	or	80-89 mm Hg	Assess the 10-year risk for heart disease and stroke using the atherosclerotic cardiovascular disease (ASCVD) risk calculator • If risk is less than 10%, start with healthy lifestyle recommendations and reassess in 3-6 months • If risk is greater than 10% or the patient has known clinical cardiovascular disease (CVD), diabetes mellitus, or chronic kidney disease, recommend lifestyle changes and BP-lowering medication (1 medication); reassess in 1 month for effectiveness of medication therapy – If goal is met after 1 month, reassess in 3-6 months – If goal is not met after 1 month, consider different medication or titration – Continue monthly follow-up until control is achieved
Hypertension: stage 2	≥140 mm Hg	or	≥90 mm Hg	Recommend healthy lifestyle changes and BP-lowering medication (2 medications of different classes); reassess in 1 month for effectiveness • If goal is met after 1 month, reassess in 3-6 months • If goal is not met after 1 month, consider different medications or titration • Continue monthly follow-up until control is achieved

2017 ACC/ AHA Hypertension Guidelines BP thresholds and recommendations for treatment

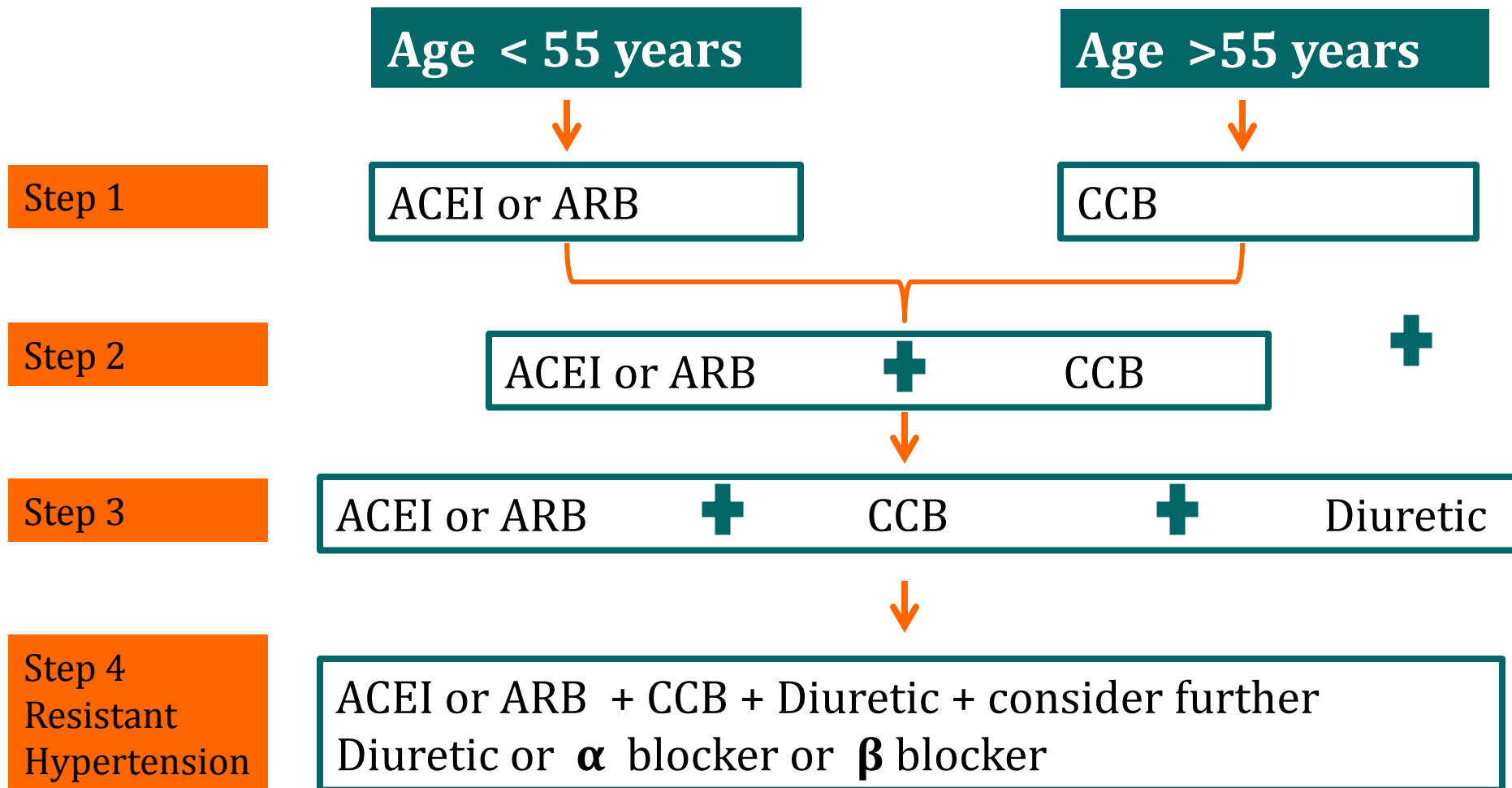


2017 ACC/ AHA Hypertension Guidelines BP thresholds and recommendations for treatment

BP Thresholds for and Goals of Pharmacological Therapy in Patients With Hypertension According to Clinical Conditions

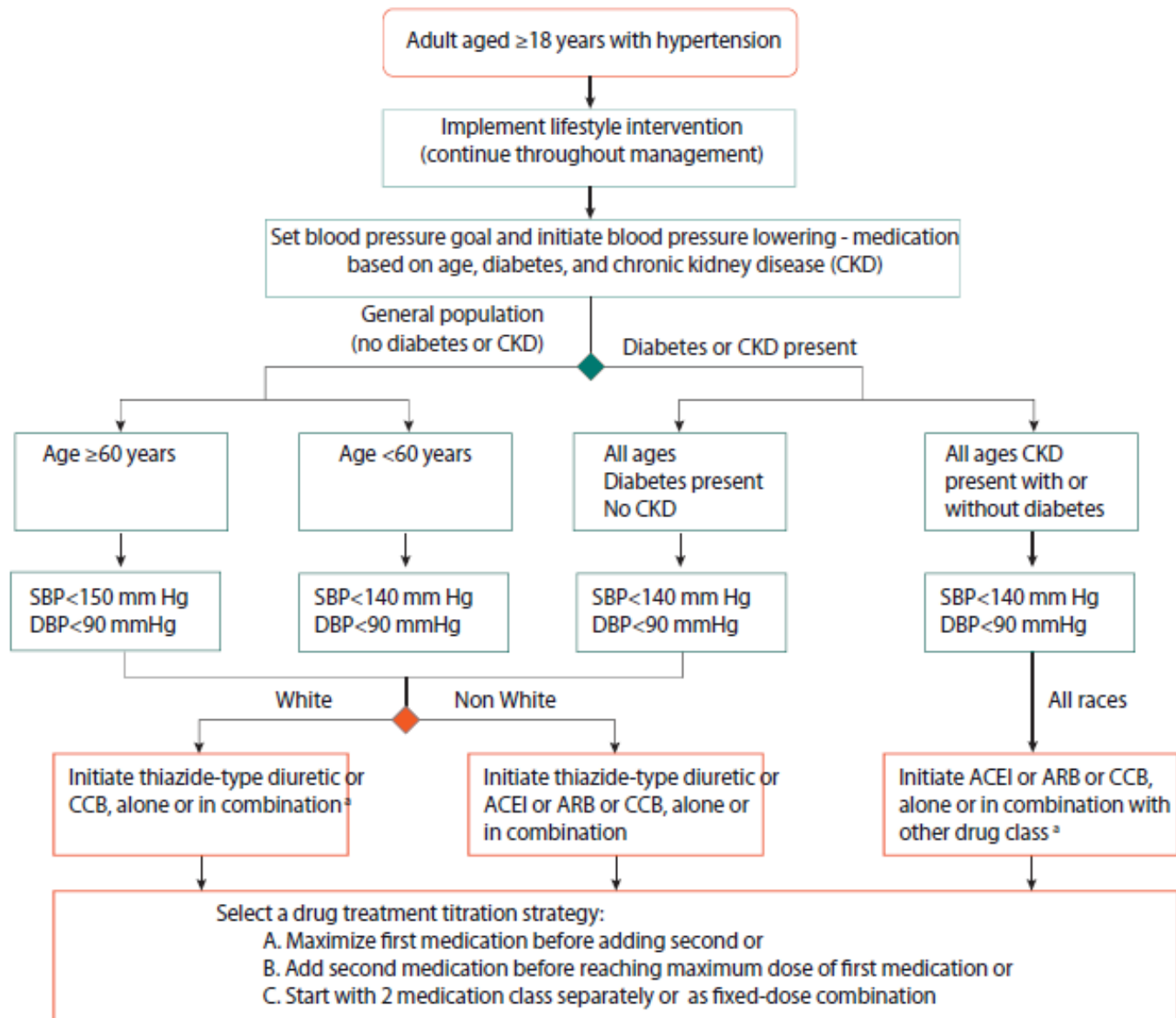
Clinical Condition(s)	BP Threshold, mm Hg	BP Goal, mm Hg
General		
Clinical CVD or 10-year ASCVD risk $\geq 10\%$	$\geq 130/80$	$< 130/80$
No clinical CVD and 10-year ASCVD risk $< 10\%$	$\geq 140/90$	$< 130/80$
Older persons (≥ 65 years of age; noninstitutionalized, ambulatory, community-living adults)	≥ 130 (SBP)	< 130 (SBP)
Specific comorbidities		
Diabetes mellitus	$\geq 130/80$	$< 130/80$
Chronic kidney disease	$\geq 130/80$	$< 130/80$
Chronic kidney disease after 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 (lacunar)	$\geq 130/80$	$< 130/80$
Peripheral arterial disease	$\geq 130/80$	$< 130/80$

NICE Clinical Guideline 2011

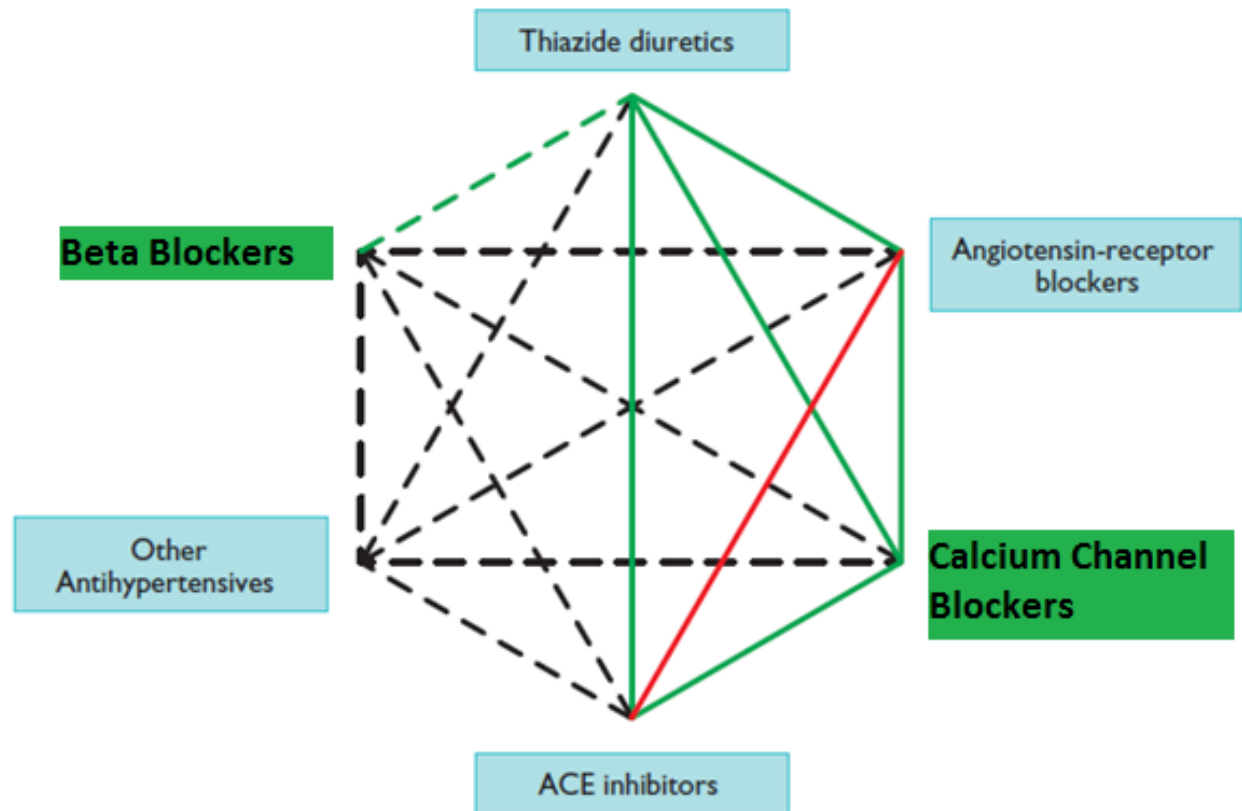


ACEI, angiotensin-converting enzyme inhibitor; ARB, angiotensin receptor blockers;
CCB- calcium channel blockers

2014 guidelines for management of hypertension in adults



European Society of Hypertension / European Society of Cardiology Guidelines



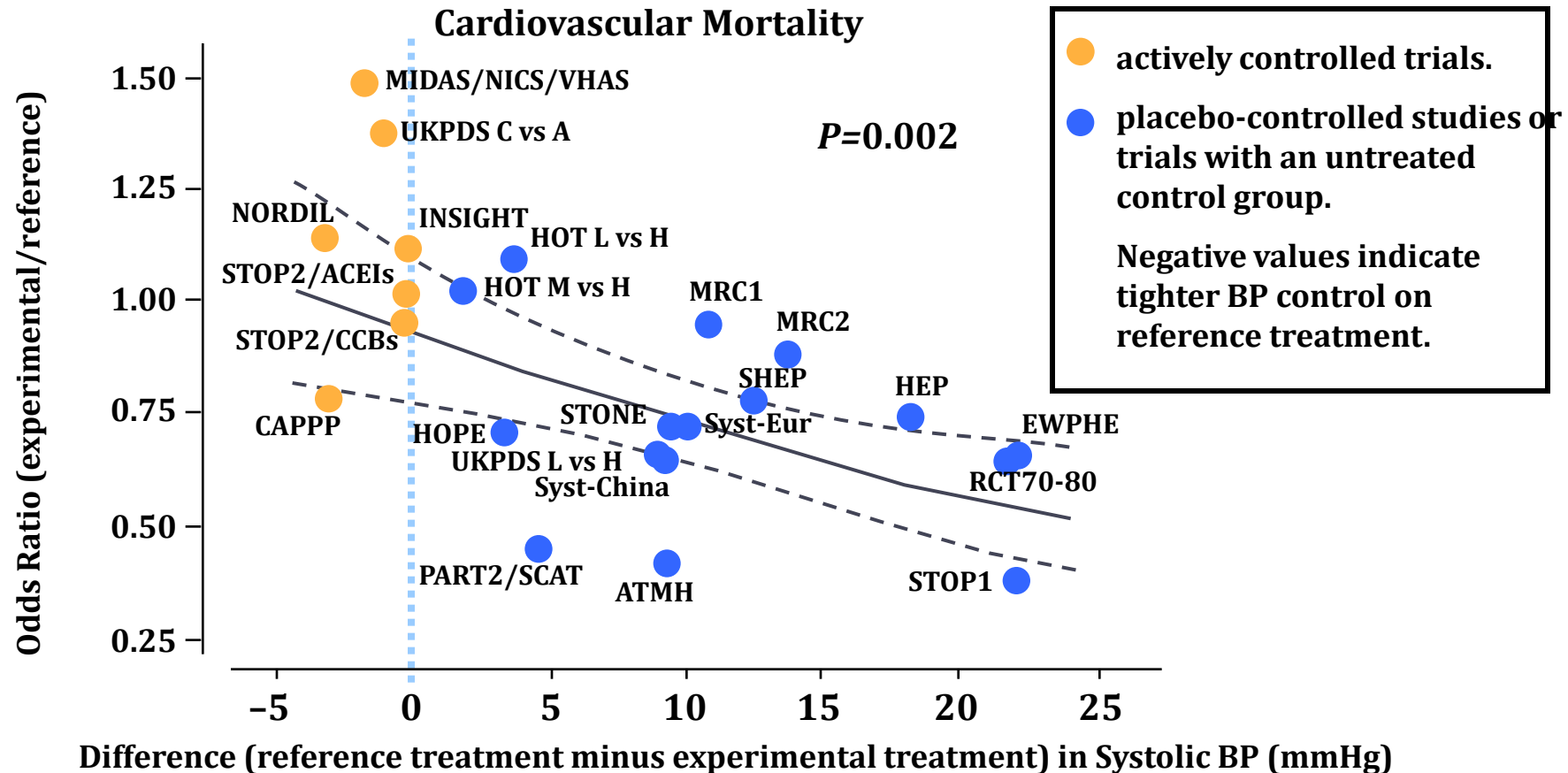
ACE = angiotensin-converting enzyme.

Possible combinations of classes of antihypertensive drugs. Green continuous lines: preferred combinations; green dashed line: useful combination (with some limitations); black dashed lines: possible but less well-tested combinations; red continuous line: not recommended combination.

Mancia G et al. Blood Press. 2014 Feb;23(1):3-16

Importance of Lowering BP

(Data from Multiple Clinical Trials Measuring the Impact of Hypertensive Therapy on Cardiovascular Mortality)



Greater differences in BP reduction mean greater reductions in the risk of CV mortality.

Conclusion

- Hypertension exerts a substantial health burden on CV health status and healthcare systems
- Around 54% of stroke and 47% of coronary heart disease are attributable to hypertension
- Over 80% of this burden occurs in low and middle income countries

Conclusion

- BP-related disease also contributes to cardiovascular death among people below hypertensive threshold of 140/90 mmHg.
- ***Hypertension remains "the silent killer".***
- Reductions in burden of BP-related death require the parallel application of the population strategy at:
 - community level and
 - the clinical strategy *focusing on new and improved treatments for people with hypertension.*



Thank You