Hypertension Update:

Translating Guidelines into daily practice 2026

Tips & Tricks in Hypertension

Dr Khalid Khan

Objectives

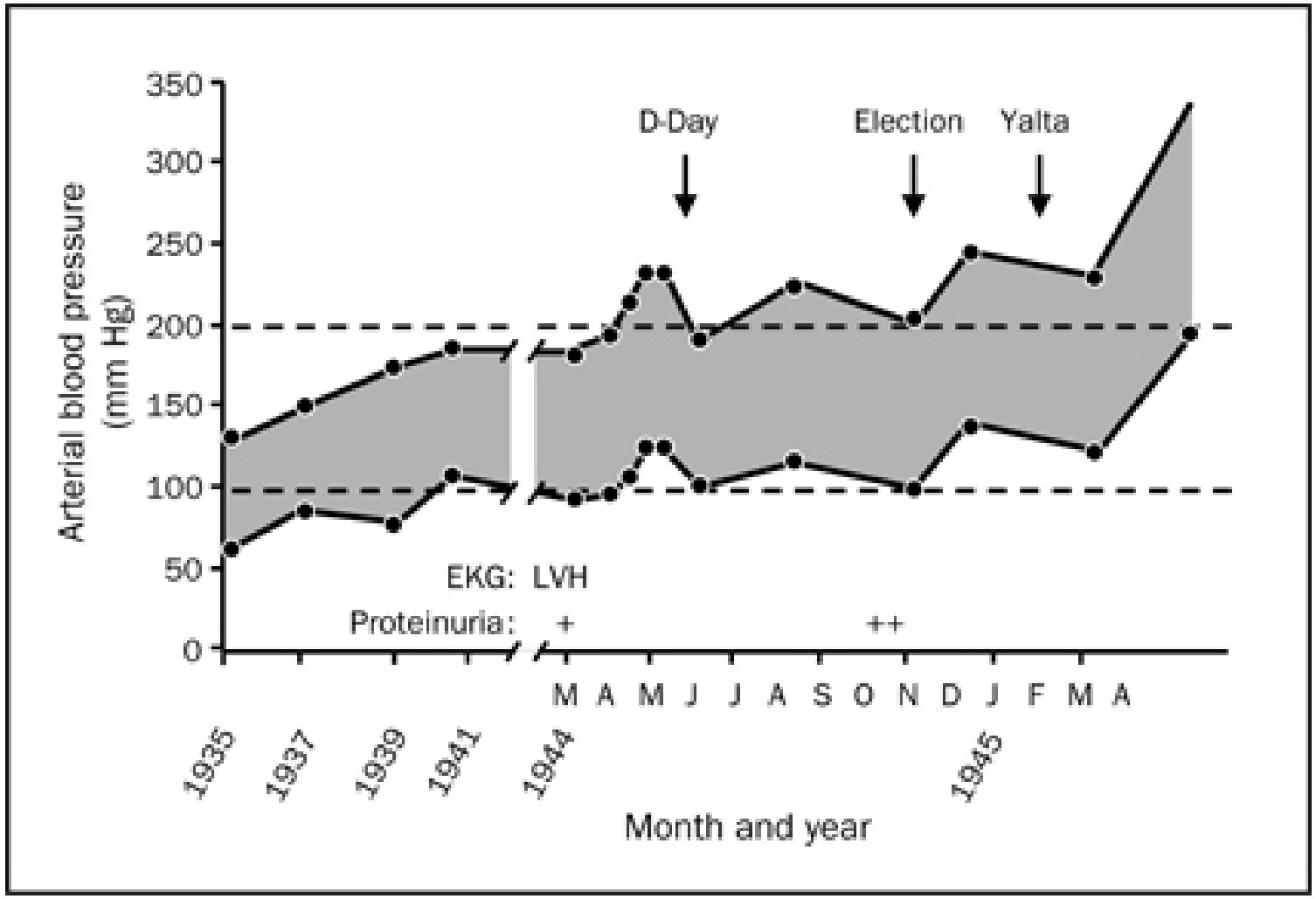
Brief Introduction

Diagnosis & Pitfalls

Treatment & Targets

Questions

FDR – BP Tracing



O'Rourke MF, Seward JB. *Mayo Clin Proc.* 2006;81:1057-1068

Contemporary Hypertension Guidelines

2024 ESC Guidelines for the management of elevated blood pressure and hypertension

Developed by the task force on the management of elevated blood pressure and hypertension of the European Society of Cardiology (ESC) and *endorsed by the European Society of Endocrinology (ESE) and the European Stroke Organisation (ESO)*

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Hypertension in adults: diagnosis and management

NICE guideline
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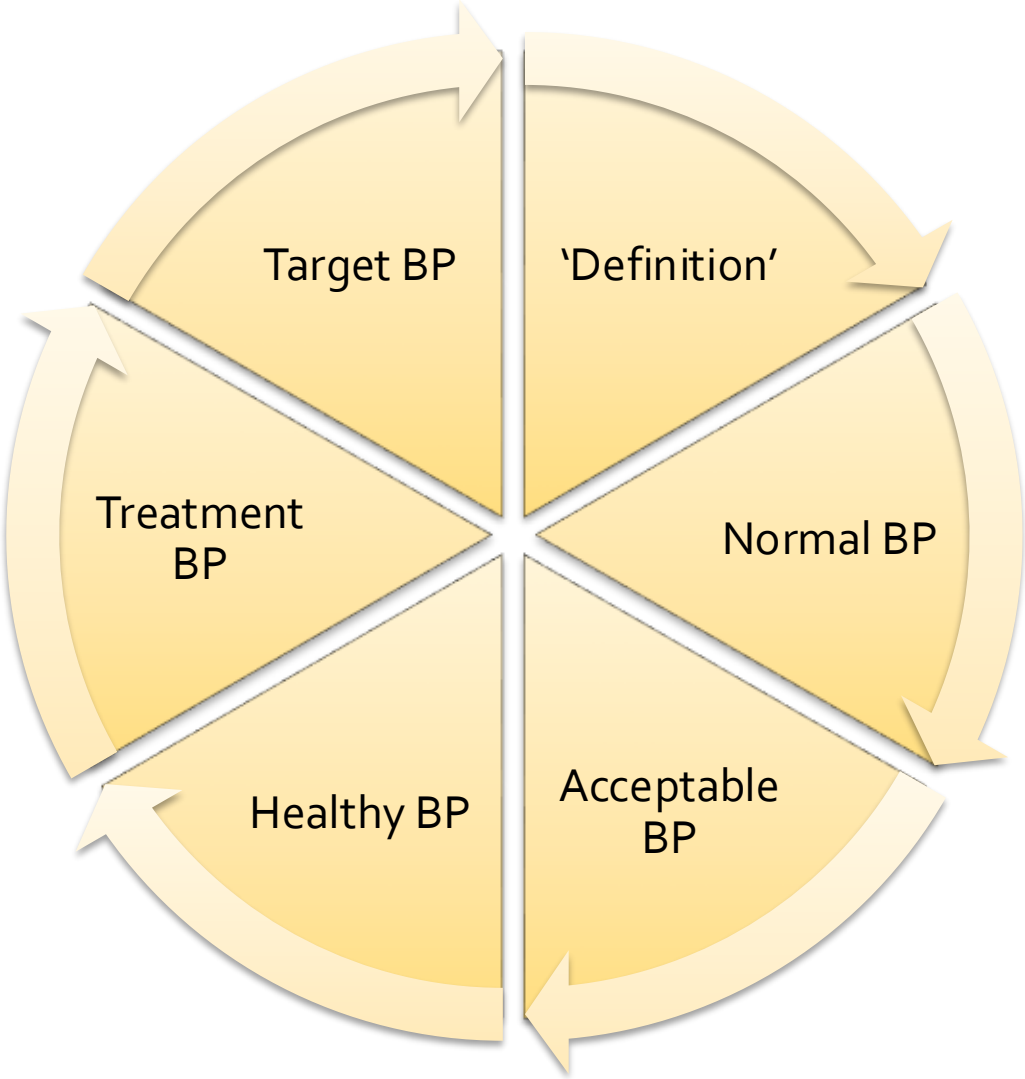
www.nice.org.uk/guidance/ng136

CLINICAL PRACTICE GUIDELINES

2025 AHA/ACC/AANP/AAPA/ABC/ACCP/ACPM/AGS/AMA/ASPC/NMA/PCNA/SGIM Guideline for the Prevention, Detection, Evaluation and Management of High Blood Pressure in Adults: A Report of the American College of Cardiology/American Heart Association Joint Committee on Clinical Practice Guidelines

Diagnosis

What do you mean by Hypertension?



What is a 'Normal' BP?

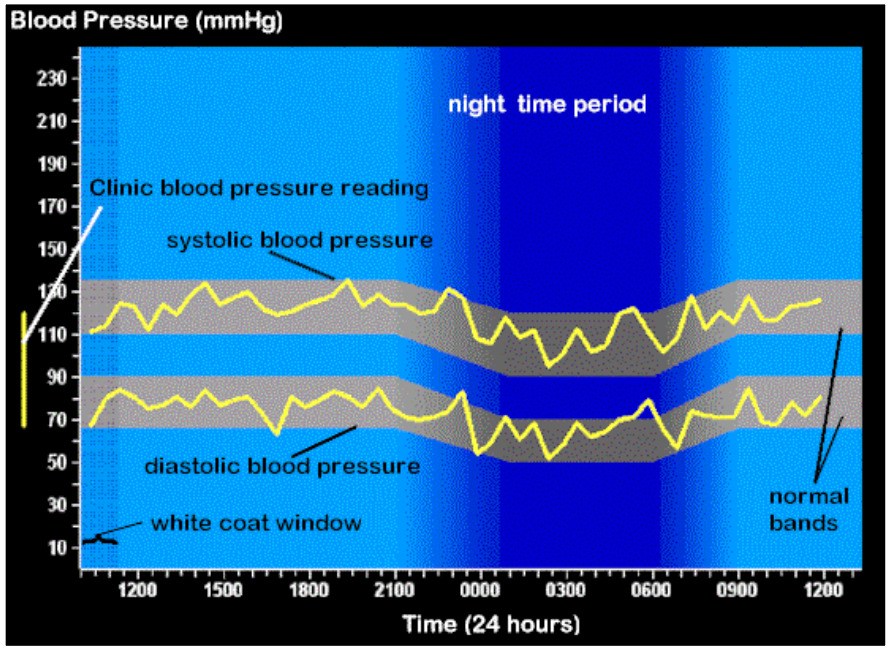
1. 100/60
2. 110/70
3. 115/75
4. 120/80
5. 130/80
6. 140/85
7. 140/90
8. 160/100

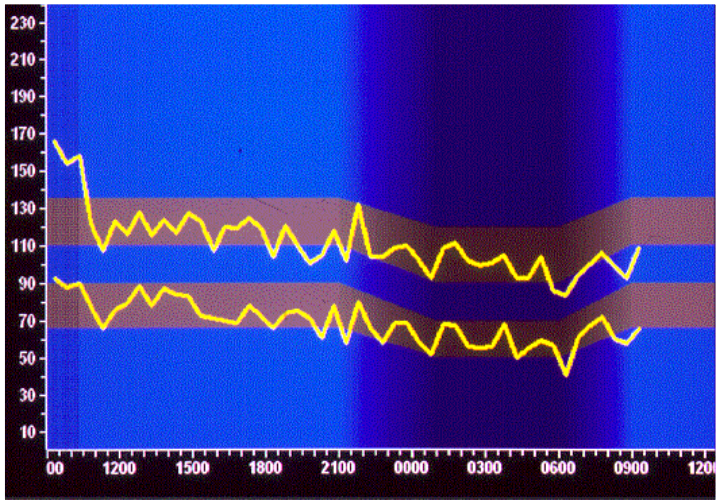
For every 20/10mmHg rise over 115/75mmg CVD risk doubles

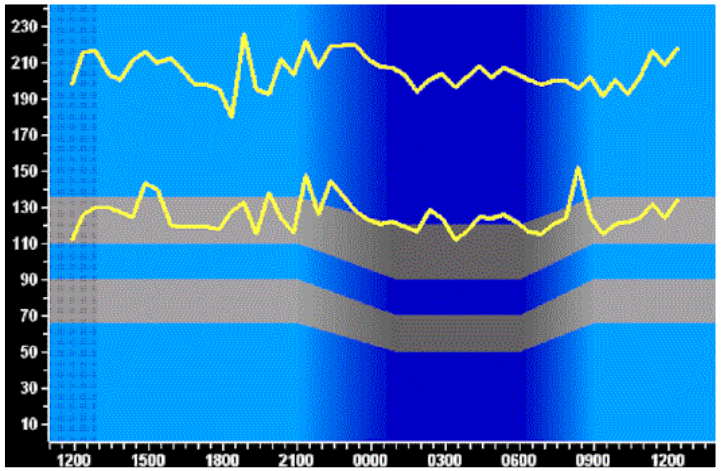
Measuring BP – which way is best?

1. Office
   - Traditional
   - Most ‘unreliable’
   - AF: Manual preferable to automated
2. Home blood pressure monitoring (HBPM)
   - Better
3. Ambulatory blood pressure (ABPM)
   - Best
   - Gold standard now

24 Ambulatory BP Monitoring





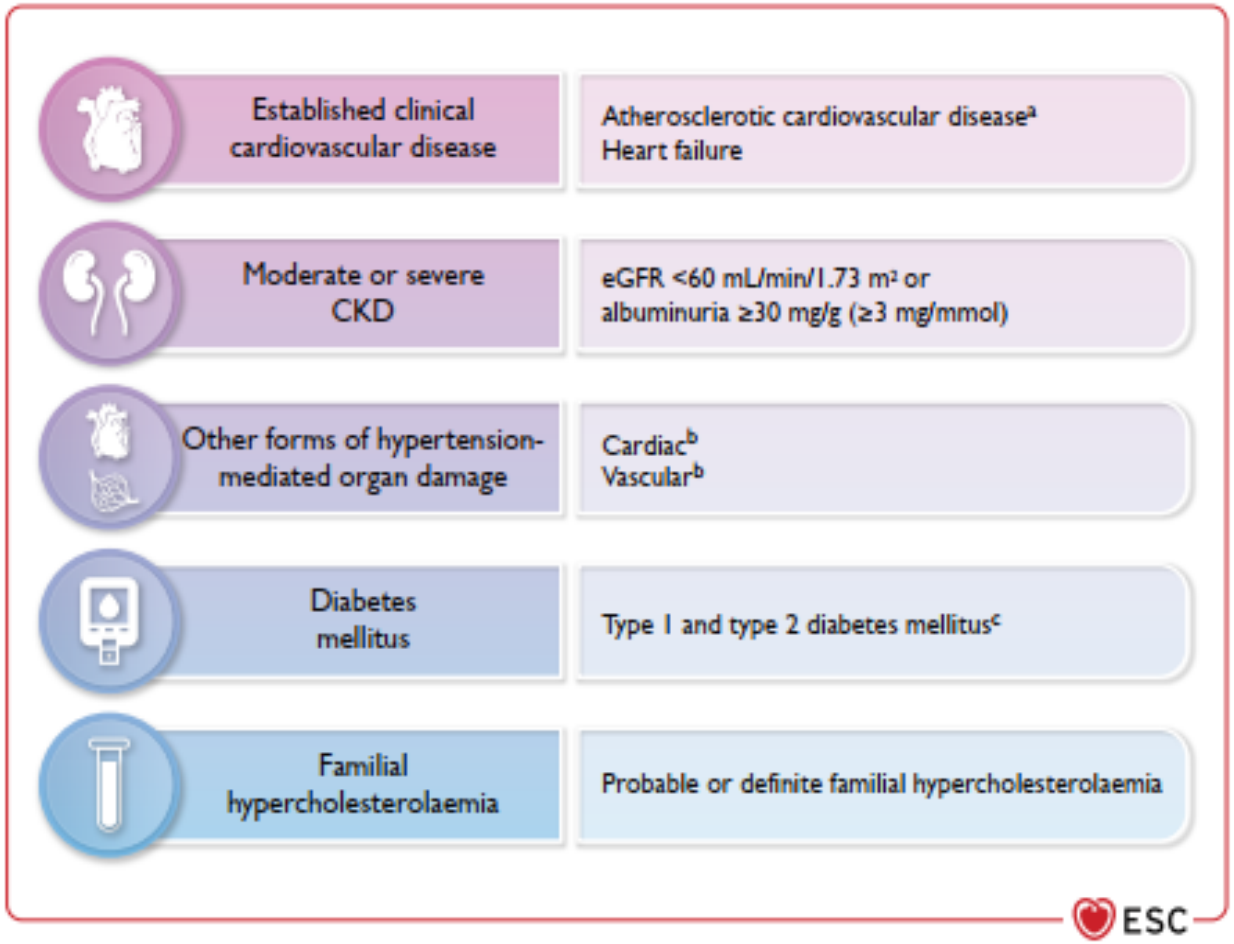


	Normal	Abnormal
Day	< 135/85	>140/90
Night	< 120/70	> 125/75
24 hour	< 130/80	> 135/85

Diagnosis Ambiguity: WCH & PHTN

- WCH: Not benign & increased risk sustained HTN
- 'Reverse' WCH (masked hypertension)
- Pseudo-hypertension (PHTN): Suspect in elderly with rigid arteries
  - Central Aortic vs. Brachial BPs
  - Marked BP but no end-organ damage
  - Clinical clues: Symptoms hypotension with Rx (escalation) but BP OK/high
  - Screening Tool: Osler's Manoeuvre (palpable radial with cuff inflated >SBP)
  - Management: Titrate Rx based on tolerance rather than aggressive cuff target

Combining with hypertension with risk



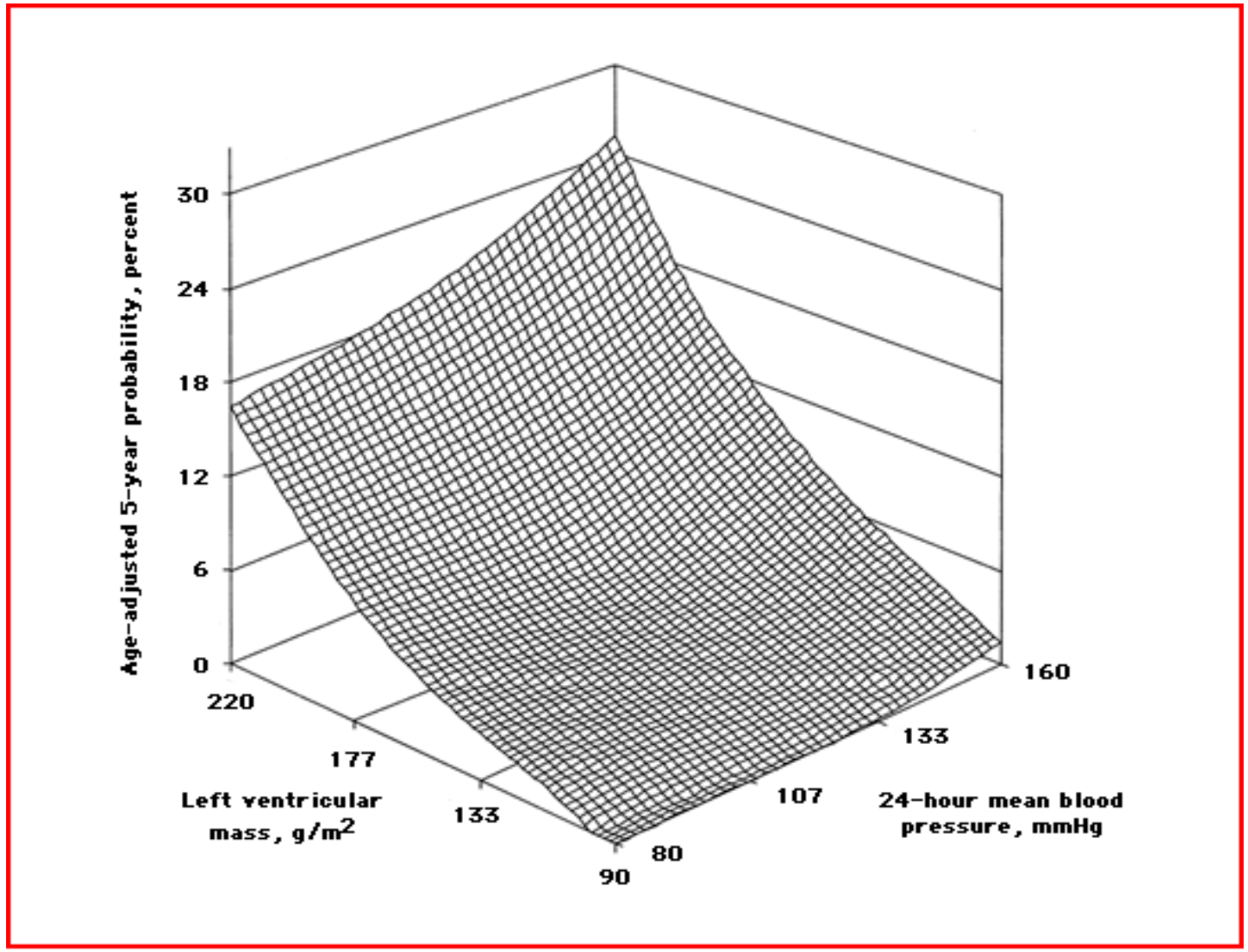
- BP value alone does not capture overall risk and need for Rx
- Co-morbidities (DM, cholesterol, ethnicity)
- Asymptomatic hypertensive end-organ damage
  - Left ventricular hypertrophy (ECG, echo)
  - Microalbuminuria / elevated albumin-creatinine ratio
  - Moderate CKD (eGFR 30 – 60)
- Established CV disease
  - Cerebrovascular, coronary disease, peripheral arterial disease
  - Heart failure, AF, severe CKD
- Calculate 10-year CVD risk

Streamlining Diagnostics: Minimum Ix

- **Confirm Diagnosis:**
  - 24-hour Ambulatory Blood Pressure Monitoring (ABPM) for all clinic readings >140/90mmHg (HBP is a 'poor' second in my view)
- **Mandatory Panel Primary Care (EOD & Risk Assessment):**
  - Renal function (including eGFR and K^+)
  - Lipid profile and TSH
  - Haemoglobin & urinalysis
  - Urinary albumin-to-creatinine ratio (UACR)
  - 12-lead ECG (screen for left ventricular hypertrophy, AF)
  - Screen for primary aldosteronism by ARR (most common 2° cause)

Why is LVH important?

- Sign of End-Organ Damage
  - Earlier treatment hypertension
- Increased Incidence
  - Stroke ↑70%
  - Heart Failure: Systolic & Diastolic x 10
  - Sudden Death ↑50%
  - Death after MI
  - Aortic Root Dilatation



The risk of a cerebrovascular event in hypertensives is related to left ventricular mass In a study of 1033 hypertensive subjects the age-adjusted five-year probability of cerebrovascular events is related to left ventricular mass, as assessed with echocardiography. (Data from Verdecchia, P, Porcellati, C, Reboldi, G, et al, Circulation 2001; 104:2039).

Treatment & Targets

Why do you treat hypertension?

A. To make patients feel better?

B. To make the BP readings lower?

C. To get paid?

D. To reduce end-organ damage?

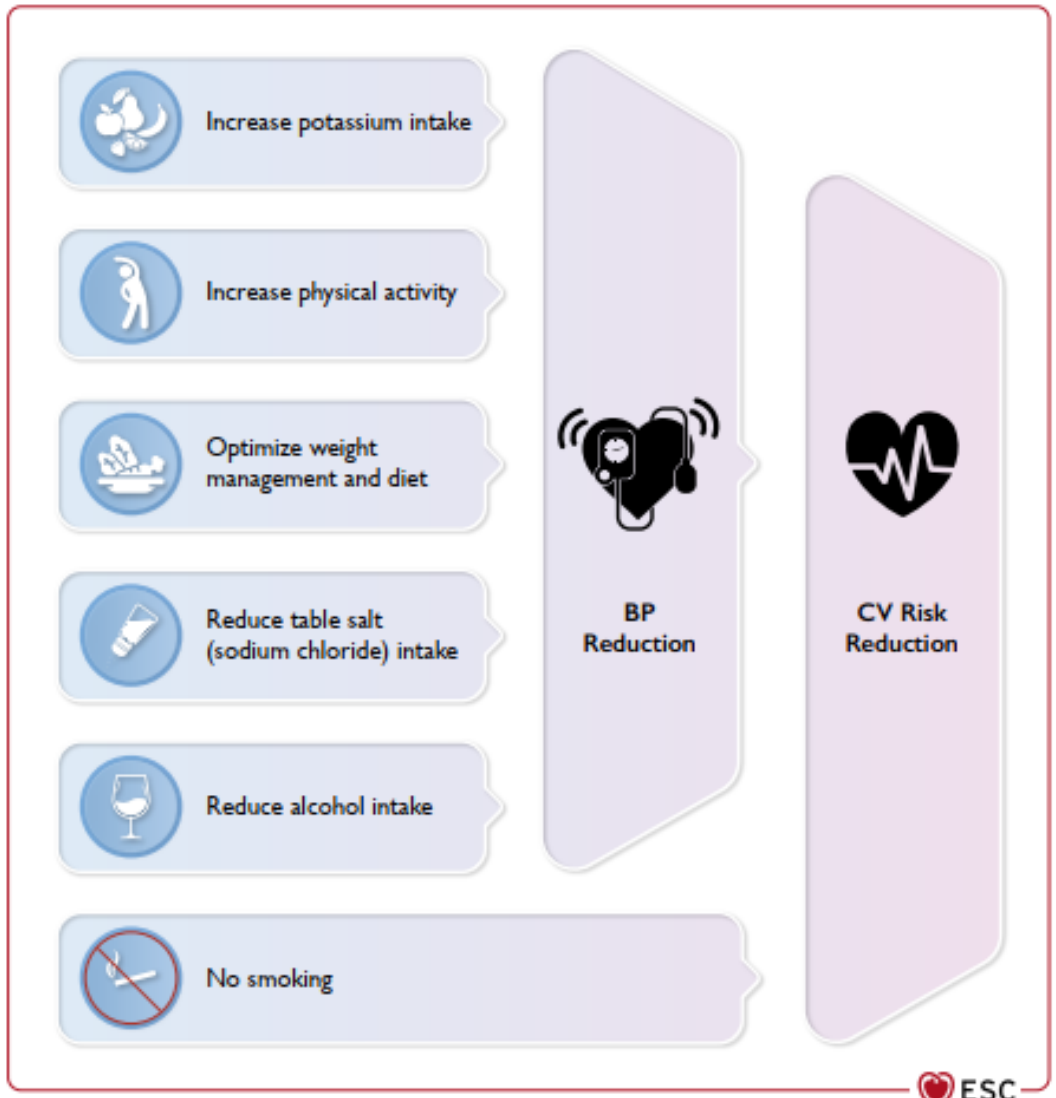
Treating Numbers or Patients

Reduction Target Blood Pressure

Shift in Objectives

Reduction Target Organ Damage

Adopting lifestyle changes in hypertension



- Regular aerobic exercise
  - Lower 7 -8 systolic & 4 -5 diastolic
- 5kg weight loss
  - Reduction of 4.4/3.6mmHg BP
- Reduction alcohol
  - Low dose (10g) increased BP 14% men
  - >30g (3 – 4U) increases BP 3.7/2.4mmHg
- Salt reduction <2g/day
  - Linear relationship salt & BP
  - Women especially sensitive to reduction

What Influences Our Drug Choices?

EMOTION	RATIONAL 'Science'
Habit	Evidence
Familiarity	Tolerability & Safety
Anecdote / Prejudice	Guidelines
1st to market	Formulary
Marketing / Reps	GP incentive scheme
'Brand'	Cost
Meetings	Effectiveness

How much bang for your buck?

- Amlodipine 10mg od
- Ramipril 10mg od
- Bendroflumethiazide 2.5mg od (alternative?)
- Perindopril 4mg + Indapamide 1.5mg
- 'Sartans'

Members of a class are different

- Groups are 'chemical' not on performance
- Differences include
  - Duration action (half-life)
  - Potency of action
  - Specificity of action (target)
  - Side-effect profile (1st → 3rd generation)
- Evidence base (proof of performance) varies
- Cost varies – is that all that matters?

Importance of 24hr BP Control

- Circadian rhythm BP - steep rise early morning
- Peak cardiac events early morning
  - Sudden cardiac death (7–9 am; Risk 2.6x higher)
  - Myocardial Infarction or UA (6am – noon; 3x higher)
  - Stroke (8am – noon)
- Target organ damage closer correlation with ABP than office BP i.e. Total BP load important
- Many drugs not 24hr – want trough/peak ratio >50% and/or long half-life
- Want good control last 4hrs

Half-lives of Common Drugs

- ACE Inhibitors
  - Captopril 8hrs
  - Enalapril 11hrs
  - Lisinopril 12.6hrs
  - Ramipril 13-17hrs (also v weak)
  - Perindopril 25hrs
- B-Blockers
  - Atenolol 6-9hrs
  - Bisoprolol 9-12hrs
  - Nebivolol >12hrs (CYP2D6)
- AT1 Blockers
  - Losartan 6-9hrs (weak/flat effect)
  - Candesartan/Valsartan 9hrs
  - Olmesartan 13hrs
  - Telmisartan >20hrs
- Ca2+ Blockers
  - Nifedipine 5hrs
  - Amlodipine >30hrs
- Diuretics
  - Chlorthalidone >40hrs, potent
  - Spironolactone 14 – 16 hrs

Choice of Antihypertensive Drug Therapy

1. Evidence-based efficacy and outcomes
2. Choice based around co-morbidities
3. Combination tablets and effective combinations
4. Duration of action of medication
5. Relevant contraindications
6. Achieve targets

Compelling and possible contraindications to the use of specific antihypertensive drugs

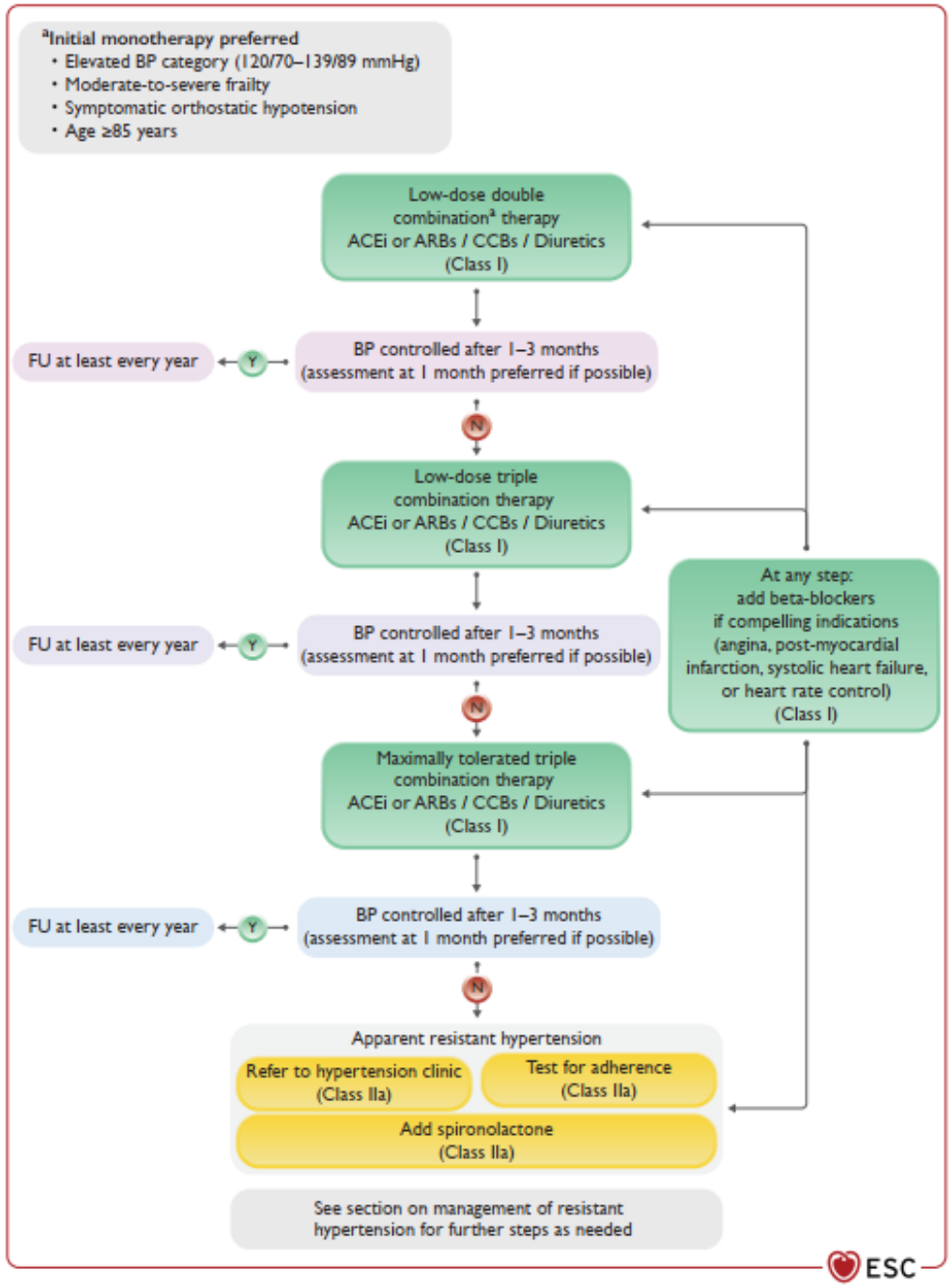
Drug	Contraindications	
	Compelling	**Possible**
Diuretics (thiazides/thiazide-type, e.g. chlorthalidone and indapamide)	• Gout	• Metabolic syndrome • Glucose intolerance • Pregnancy • Hypercalcemia • Hypokalemia
Beta-blockers	• Asthma • Any high-grade sino-atrial or atrioventricular block • Bradycardia (heart rate < 60 beats per min)	• Metabolic syndrome • Glucose intolerance • Athletes and physically active patients
Calcium antagonists (dihydropyridines)		• Tachyarrhythmia • Heart failure (HFrEF, class III or IV) • Pre-existing severe leg oedema
Calcium antagonists (verapamil, diltiazem)	• Any high-grade sino-atrial or AV block • Severe LV dysfunction (LV EF < 40%) • Bradycardia (heart rate < 60 beats per min)	• Constipation
ACE inhibitors	• Pregnancy • Previous angioneurotic oedema • Hyperkalemia (potassium > 5.5 mmol/L) • Bilateral renal artery stenosis	• Women of child-bearing potential without reliable contraception
ARBs	• Pregnancy • Hyperkalemia (potassium > 5.5 mmol/L) • Bilateral renal artery stenosis	• Women of child-bearing potential without reliable contraception

With BP treatment should/do you start with?

A. Start with one drug

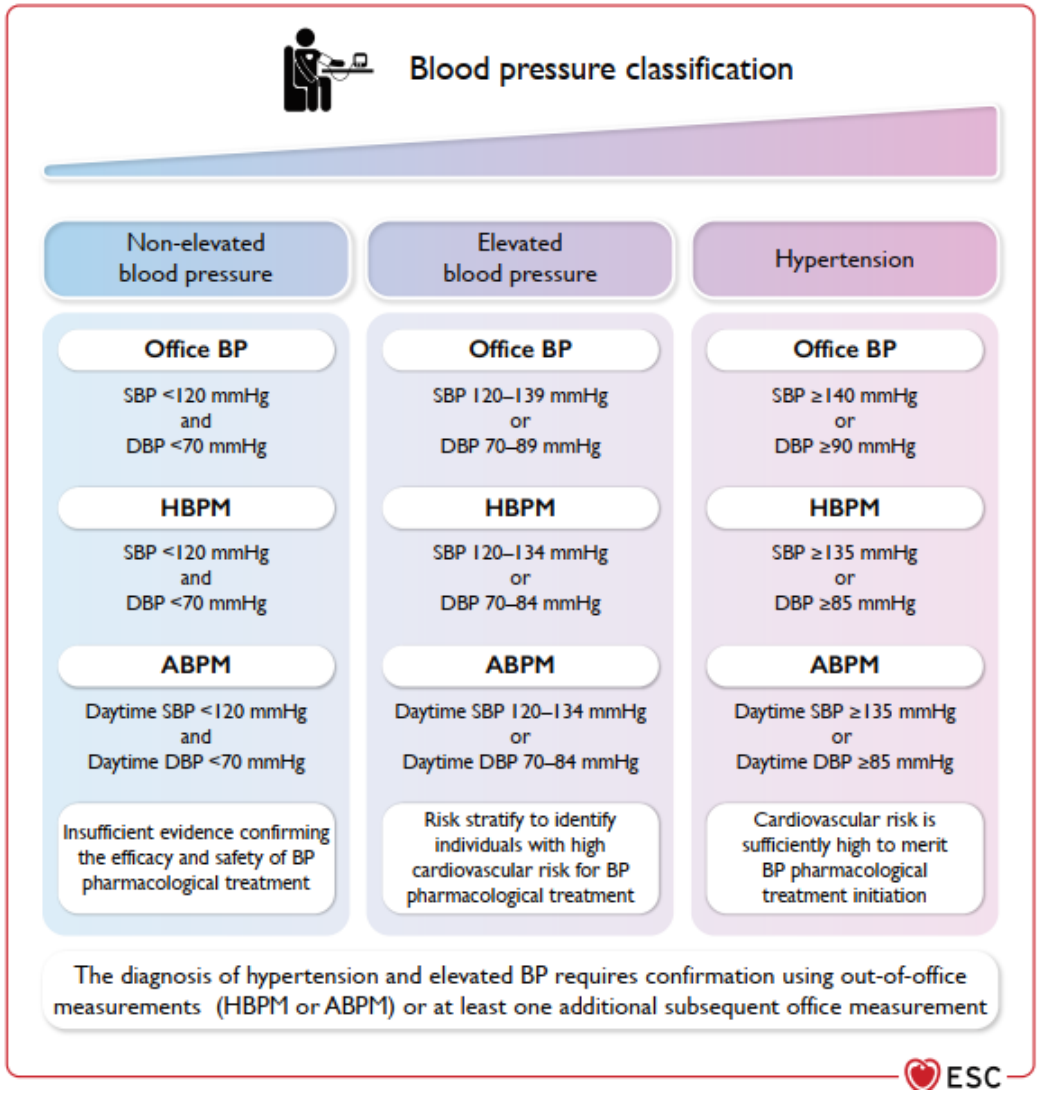
B. Start with two drugs separately

C. Use two drugs in combination



Preference for single-pill combinations over two separate pills is rooted in evidence demonstrating substantial improvements in patient adherence and a reduction in the time required to achieve target BP control.

Evolving Goals: Earlier and Tighter Control



- **Focus on Primary Prevention:** Lifestyle modification remains essential to prevent progression, especially in Stage 1 HTN (130–139/80–89 mmHg).
- **Lower Threshold for High-Risk Patients:** Drug therapy is strongly recommended for high-CVD risk adults with Stage 1 HTN (130–139/80–89 mmHg), often after 3-6 months of failed lifestyle intervention
- **Intensified SBP Target:** The optimal goal is now lower, driven by major trial data:
  - ESC 2024: SBP target of 120 – 129mmHg for most patients (optimal 120 mmHg).
  - ACC/AHA 2025: Target SBP <130 mmHg, with encouragement to achieve <120mmHg

Is NICE is still nice?

Where does this fit in 2026?

2019 Guidance updated in 2022

Rationale

- Population vs individual
- Achievable targets vs ideal
- Science vs Pragmatism
- Committee composition

1.4.20 For adults with hypertension aged under 80, reduce clinic blood pressure to below 140/90 mmHg and ensure that it is maintained below that level. See also table 1 for guidance on clinic blood pressure targets for people aged under 80 with type 1 diabetes or severe chronic kidney disease. **[2019, amended 2022]**

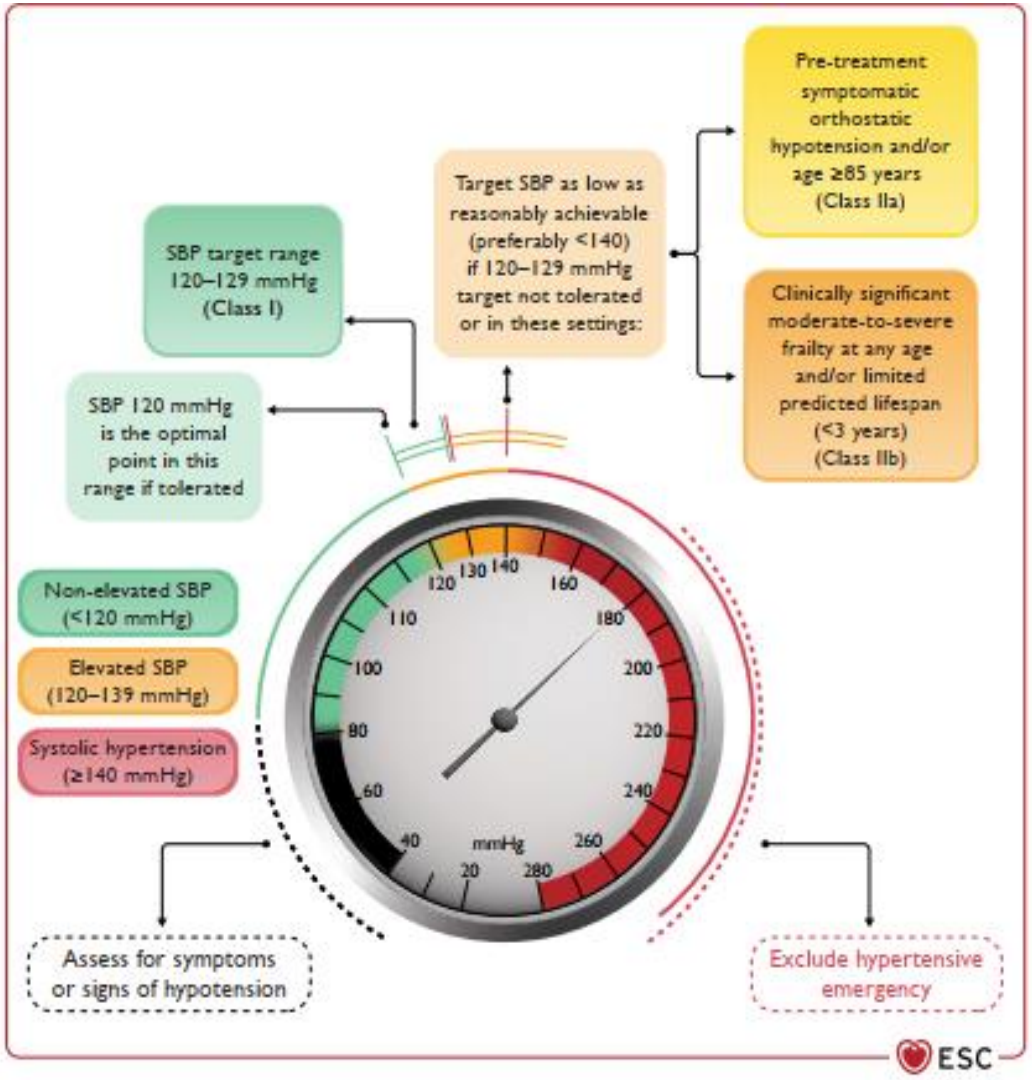
1.4.21 For adults with hypertension aged 80 and over, reduce clinic blood pressure to below 150/90 mmHg and ensure that it is maintained below that level. Use clinical judgement for people with frailty or multimorbidity (see NICE's guideline on multimorbidity). See also table 2 for guidance on clinic blood pressure targets for people aged 80 and over with type 1 diabetes or severe chronic kidney disease. **[2019, amended 2022]**

1.4.22 When using ABPM or HBPM to monitor the response to treatment in adults with hypertension, use the average blood pressure level taken during the person's usual waking hours (see recommendations 1.2.6 and 1.2.7). Reduce blood pressure and ensure that it is maintained:

- below 135/85 mmHg for adults aged under 80
- below 145/85 mmHg for adults aged 80 and over.

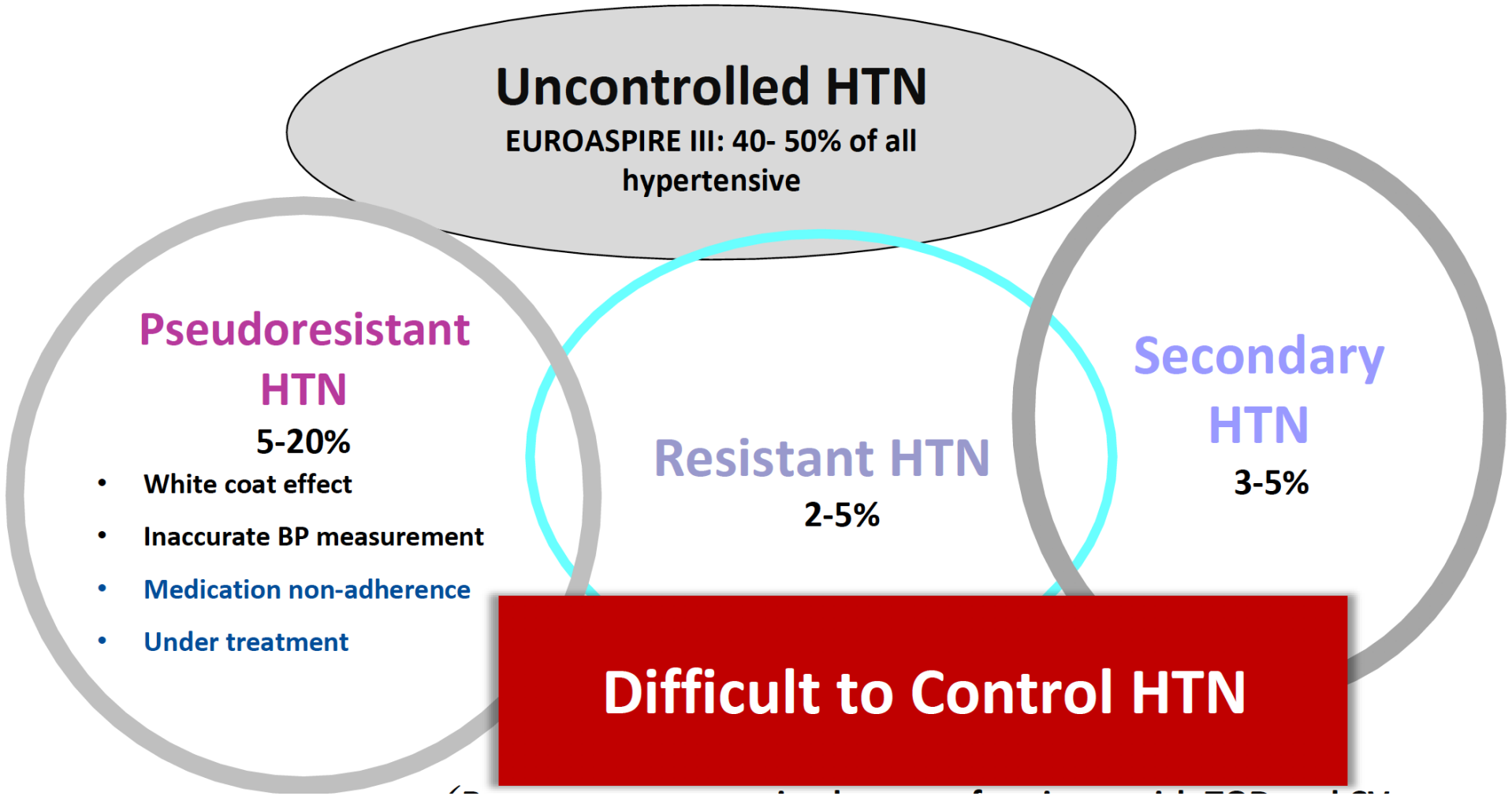
Use clinical judgement for people with frailty or multimorbidity (see also NICE's guideline on multimorbidity). **[2019, amended 2022]**

Treatment Targets



- Aim SBP <120 – 129mmHg
- 120mmHg is optimal point
- Otherwise targets as low as possible (<140) if not tolerated or these settings
  - Orthostatic hypotension >85yrs
  - Moderate to severe frailty
  - Limited life span <3years

Resistant Hypertension?

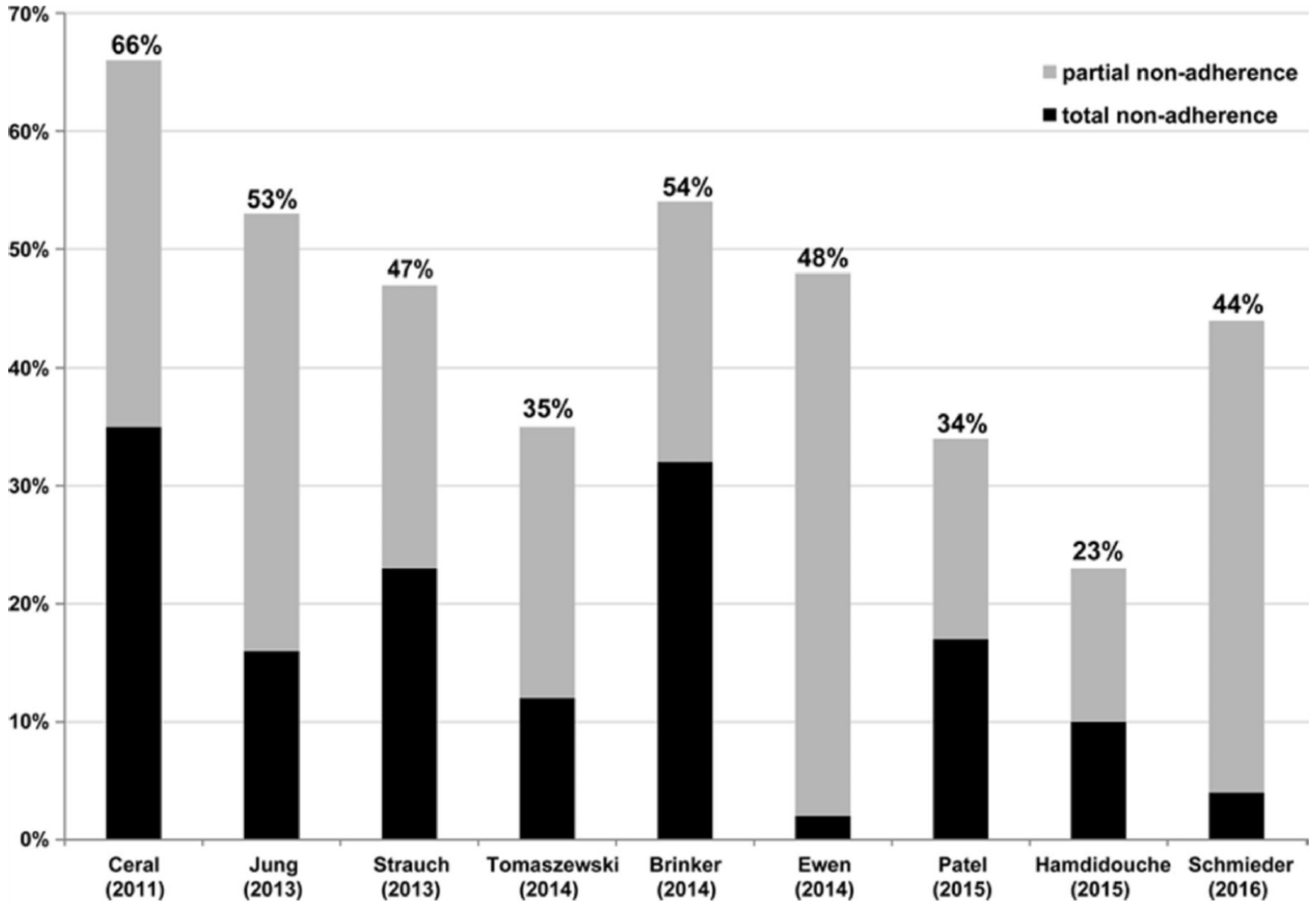


Resistant Hypertension – Stepwise approach

- **Definition:** BP above goal despite 3 concurrent agents at optimal doses
- **Exclude Pseudo-Resistance:**
  - Non-adherence (most common cause, consider objective testing)
  - Interfering drugs (e.g., NSAIDs)
  - Lifestyle factors (weight loss, physical activity, restrict dietary sodium, alcohol abstinence)
- **Systematic Screening for Secondary Hypertension:**
  - Primary Aldosteronism (PA): Screen all RH patients using the Aldosterone-to-Renin Ratio (ARR)
  - Obstructive Sleep Apnoea (OSA): Underdiagnosed; CPAP reduces 24hr ABPM significantly
  - Renal Artery Stenosis (RAS)
- **Pharmacologic Intensification:**
  - Optimize Diuretic: switch to Chlorthalidone if eGFR >30; If eGFR <30 use loop bd (e.g furosemide)
  - Add an MRA: Spironolactone 12.5 – 25mg or Eplerenone 50mg offers significant benefit

Poor Adherence to Therapy: Widespread, Dynamic & Difficult to Detect

Proportion of poor or nonadherence according to drug monitoring in different cohorts of patients with apparently resistant hypertension



Common causes of secondary hypertension

Cause	Prevalence in hypertensive patients
Obstructive sleep apnoea	5–10%
Renal parenchymal disease	2–10%
Renovascular disease: Atherosclerotic renovascular disease Fibromuscular dysplasia	1–10%
Endocrine causes: Primary Aldosteronism Phaeochromocytoma Cushing's syndrome Thyroid disease (hyper- or hypothyroidism) Hyperparathyroidism	 5–15% < 1% < 1% 1–2% < 1%
Other causes: Coarctation of the aorta	 < 1%

Incidence and typical causes of secondary hypertension according to age

Age group	Per cent with underlying cause	Typical causes
Young children (< 12 years)	70–85	Renal parenchymal disease Coarctation of the aorta Monogenic disorders
Adolescents (12–18 years)	10–15	Renal parenchymal disease Coarctation of the aorta Monogenic disorders
Young adults (19–40 years)	5–10	Renal parenchymal disease Fibromuscular disease (especially in women) Undiagnosed monogenic disorders
Middle-aged adults (41–65 years)	5–15	Primary aldosteronism Obstructive sleep apnoea Cushing's syndrome Phaeochromocytoma Renal parenchymal disease Atherosclerotic renovascular disease
Older adults (> 65years)	5–10	Atherosclerotic renovascular disease Renal parenchymal disease Thyroid disease

Managing Multiple Drug Intolerance

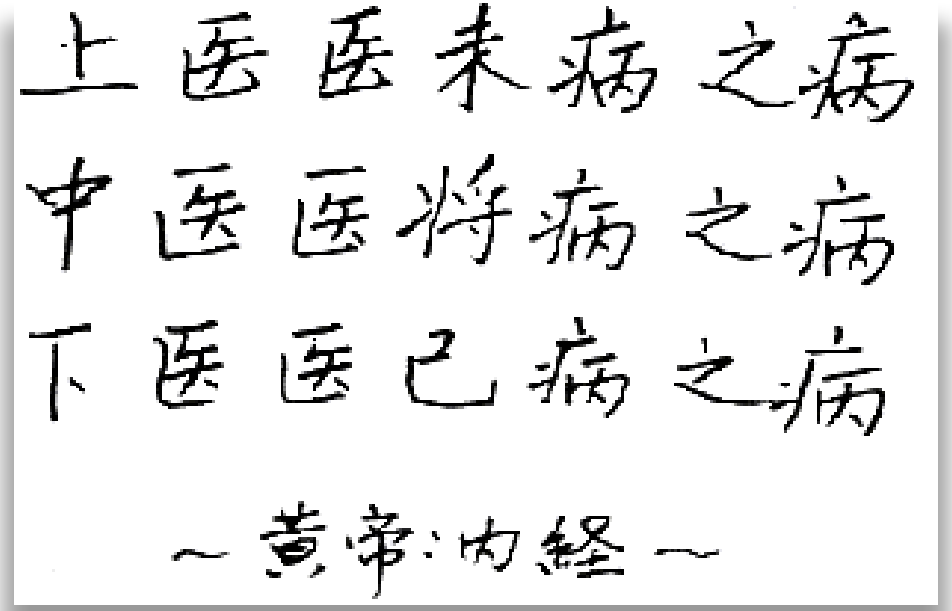
- Avoid blame & tackle understanding & beliefs
- Structured approach to drug intolerance → adherence failure
- Stepped-care algorithm
  - Fractional dosing: Use quarter/half tablets to minimize peak concentration and ADRs (sig reductions office/home BP)
  - Liquid formulations: Allows for ultra-low dose titration
  - Transdermal agents (specialist): patch delivery ensure steady state
  - Off-label/unlicensed drug (specialist) e.g. PDE-5 inhibitors

Take Home Messages Drug Treatment BP

- Most patients need >2 drugs for 'control'
- Not all drugs are created equal
  - Newer generations within classes e.g. Zanidip
  - Length & magnitude of action (all 4 ABCD groups)
- Combination drugs preferable (early)
  - Improve compliance e.g. ACE-I + Ca2+-blocker
  - Improve control
  - Permutations A+C+D available as single tablet
- Spironolactone (low dose) useful adjunct
- Approaching resistant hypertension & multiple drug intolerances

Can't Always Win…

"I've always been a high achiever, always striving for bigger, faster, greater…and now suddenly I'm expected to settle for *lower* blood pressure and *less* cholesterol?!"



Superior doctors prevent the disease

Mediocre doctors treat the disease before it is evident

Inferior doctors treat the full blown disease

Huang Dee Nai-Chang (2,600 BC 1st Chinese Medical Text)

The End – Questions?