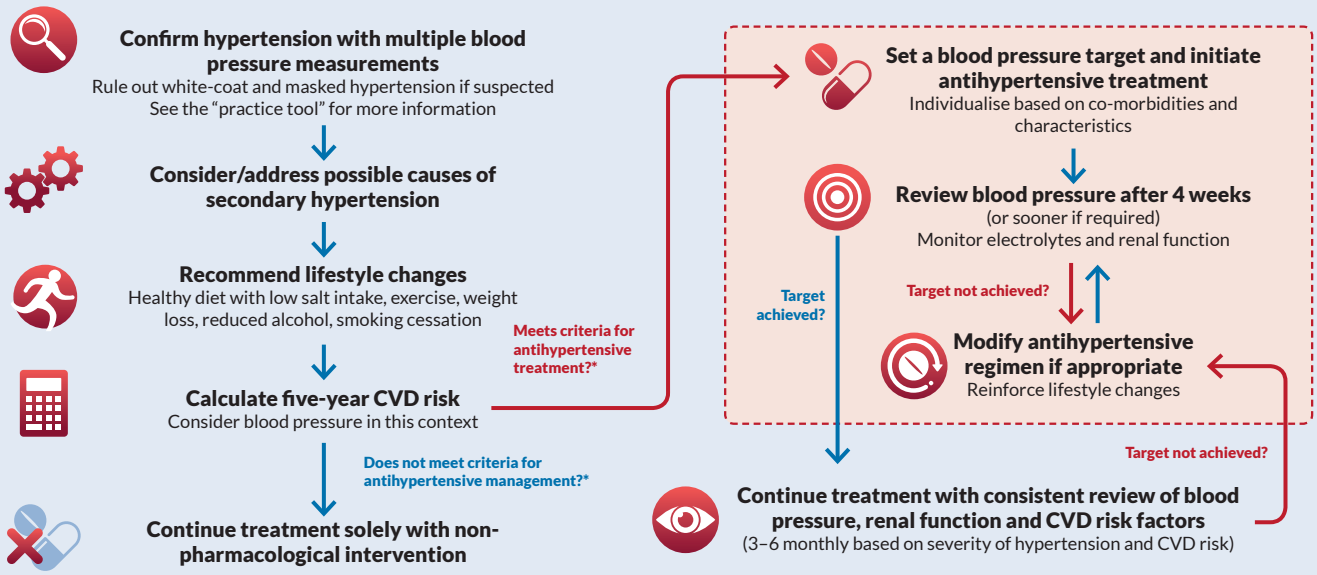
SUMMARY

Hypertension: controlling the "silent killer"

Overview: a risk-based approach to management is recommended



* Criteria for using antihypertensive medicines is detailed directly below

WHAT'S NEW?

Use NZ Primary Prevention (NZPP) equations to calculate five-year CVD risk + guide antihypertensive use if a patient's blood pressure is persistently ≥ 130/80 mmHg

- NZPP equations are incorporated into the BPAC Clinical Solutions *bestpractice* CVD Management module

Five-year CVD risk	Recommendation
< 5%	Antihypertensives **not recommended**; lifestyle changes alone are sufficient
5–15%	Consider antihypertensives if blood pressure is ≥ 140/90 mmHg
≥ 15%	Antihypertensives **recommended**
≥ 160/100 mmHg and any risk level	Antihypertensives **recommended**

Prescribing antihypertensives

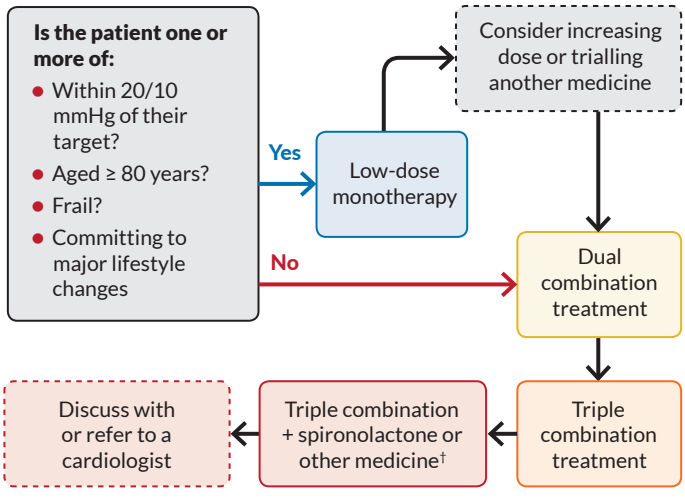
Guidelines are now recommending initial low-dose dual antihypertensive treatment for some patients

Half the standard dose of a single antihypertensive provides **80% of the max BP-lowering effect**; effects are **additive** when combining low dose antihypertensives

The **risk of adverse effects increases substantially with higher doses*** of a single antihypertensive compared with using low-dose combinations

Night-time once daily dosing is usually preferred if tolerated

ACE inhibitors/ARBs, CCBs and thiazide diuretics are all equal first-line choices; beta-blockers are not (unless indicated)



* Higher doses of ACE inhibitors/ARBs do not substantially increase the risk of adverse effects
† Such as a beta-blocker or an alpha blocker

ACE, angiotensin-converting enzyme; ARB, angiotensin receptor blocker; CCB, calcium channel blocker; CVD, cardiovascular disease

SUMMARY

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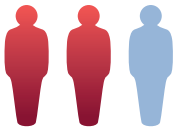
WHAT'S NEW?

Individualise blood pressure targets based on CVD risk and treatment objectives

	Clinic measurement	Ambulatory or at-home measurement
"High" CVD risk, including current ASCVD, heart failure, reduced ejection fraction, diabetes mellitus, CKD, aged ≥65 years, 5-year CVD risk ≥15%	<130/80 mmHg	<125/80 mmHg
"Lower" CVD risk None of the above risk factors	<140/90 mmHg	<135/90 mmHg
Severe frailty, dementia, limited life expectancy	Discuss treatment goals to guide decision making; targets can be more lenient and antihypertensives may need to be stopped	

Reviewing the options for hypertension

Co-morbidities affect antihypertensive selection



Two out of every three people with hypertension have a comorbidity

See the full presentation slides for a comprehensive list of contraindications

Elderly and/or frail patients

- Antihypertensives continue to be effective but frailty may be a reason to avoid treatment in some cases
- Emphasise lifestyle modifications (if achievable)
- Blood pressure reductions should generally be gradual

Pregnancy

Recommended antihypertensives during pregnancy (all fully subsidised)	**Avoid during pregnancy**
• Labetalol • Nifedipine • Methyldopa	• ACE inhibitors • ARBs

If risk factors are present for pre-eclampsia, initiate **calcium supplementation** once the pregnancy is confirmed and initiate **aspirin** at 12 weeks (100 mg nocte)

ACE, angiotensin-converting enzyme; ARB, angiotensin receptor blocker; ASCVD, atherosclerotic cardiovascular disease; CCB, calcium channel blocker; CKD, chronic kidney disease; CVD, cardiovascular disease; nocte, every night

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First-line antihypertensives

(all fully subsidised) - Selection is based on clinical preference and patient characteristics

Class		Medicine*		Usual dose range for hypertension	Notes
ACE inhibitor		Cilazapril		Initially 1 mg once daily; maintenance dose 2.5–5 mg once daily; max 5 mg daily	Do not use ACE inhibitors in combination with ARBs Monitor electrolytes and renal function There is an increased risk of acute renal failure in patients with severe bilateral renal artery stenosis, and increased risk of hyperkalaemia, especially in patients with CKD or in those on potassium-supplements or -sparing drugs Avoid during pregnancy
		Enalapril		Initially 5 mg once daily; maintenance dose 20 mg once daily; max 40 mg daily	
		Quinapril		Initially 10 mg once daily; maintenance dose 20–40 mg daily in 1–2 divided doses	
ARB		Candesartan		Initially 8 mg once daily, increase if necessary every 4 weeks to max 32 mg once daily; usual maintenance dose 8 mg once daily	
		Losartan		Initially 50 mg once daily (less if aged ≥75 years), increase if necessary every 3–6 weeks to max 100 mg once daily; usual maintenance dose 50 mg once daily	
CCB	Dihydropyridines	Amlodipine		Initially 5 mg once daily; max 10 mg once daily	Avoid in patients with heart failure with reduced ejection fraction (amlodipine or felodipine may be used if CCBs are required) Dihydropyridines have a higher risk of dose-related pedal oedema Avoid using non-dihydropyridines with beta blockers (increased risk of bradycardia)
		Felodipine		Initially 5 mg once daily in morning (2.5 mg if elderly); maintenance dose 5–10 mg once daily	
	Non-Dihydropyridines	Diltiazem	MR	180–240 mg once daily, increase if necessary every 14 days; maintenance dose 240–360 mg once daily	
		Verapamil	IR	Initially 80 mg 2–3 times daily, increase if necessary to 160 mg 2–3 times daily	
			MR	Initially 120–240 mg daily, increase if necessary to 240 mg twice daily	
Thiazide (-type) diuretic		Bendroflumethiazide		2.5 mg once daily in the morning	Chlortalidone is often preferred due to its prolonged half-life and SBP-lowering effect Monitor electrolytes and renal function Avoid during pregnancy and with gout
		Chlortalidone		12.5–25 mg once daily in the morning	
		Indapamide		2.5 mg once daily in the morning	

* The selection process is generally determined by clinical preference and patient characteristics. Not all available antihypertensives are listed here; refer to the NZF for additional options.

ACE, angiotensin-converting enzyme; ARB, angiotensin receptor blocker; CCB, calcium channel blocker; CKD, chronic kidney disease; IR, immediate release; MR, modified release; SBP, systolic blood pressure

Other medicines to consider if needed

Class		Medicine		Usual dose range for hypertension	Notes
Non-thiazide diuretic		Furosemide		40–80 mg daily	Consider furosemide over thiazide diuretics if the patient has an eGFR <30 mL/min/1.73 m^2 Avoid during pregnancy
		Spironolactone		25 mg once daily; ongoing monitoring of serum potassium and creatinine is important	
Alpha-blocker		Doxazosin		1 mg daily, increase after 1–2 weeks to 2 mg once daily, and thereafter to 4 mg once daily, if necessary; max 16 mg daily	May cause urinary stress incontinence and loss of bladder control in some women; may be beneficial in men with benign prostatic hyperplasia to alleviate nocturia Avoid during pregnancy or if there is a history of postural hypotension
Beta-blocker	Without ISA	Metoprolol succinate	MR	Initially 47.5 mg once daily increased if necessary; max 190 mg daily	Now play a limited role (fourth-line) in the management of hypertension and are usually only considered if there is a clinical need e.g. atrial fibrillation, acute myocardial infarction and heart failure All beta-blockers are considered equally as effective for treating hypertension Dose adjustments may be required in patients with renal dysfunction
		Atenolol		25–50 mg daily (higher doses not usually necessary)	
		Carvedilol		Initially 12.5 mg once daily, increase after 2 days to usual dose of 25 mg; max 50 mg daily	
		Bisoprolol		10 mg once daily (5 mg may be adequate in some patients); max 20 mg daily	
	With ISA	Celiprolol		200 mg once daily in the morning, increase to 400 daily if necessary	
		Pindolol		Initially 5 mg 2–3 times daily or 15 mg once daily; increase as required at weekly intervals; maintenance 15–30 mg daily (doses >15 mg given in 2 divided doses); max 45 mg daily	
Fixed-dose combinations (Currently available, Mar 2020)		Losartan + hydrochlorothiazide		Initially 1 tablet once daily; max 2 tablets once daily	Useful in patients with poor adherence to multiple prescribed antihypertensives Avoid during pregnancy Hydrochlorothiazide may be associated with an increased long-term risk of non-melanoma skin cancer
		Quinapril + hydrochlorothiazide		Initially 10/12.5 mg daily, increase to 20/12.5 mg daily if necessary	

eGFR, estimated glomerular filtration rate; ISA, intrinsic sympathomimetic activity; MR, modified release

References: 1. Whelton PK, Carey RM, Aronow WS, et al. Circulation. 2018;138:e426-83; 2. Williams B, Mancia G, Spiering W, et al. J Hypertens. 2018;36:2284–309; 3. Boffa RJ, Constanti M, Floyd CN, et al. BMJ. 2019;367:l5310. 4. Kennard L, O'Shaughnessy KM. BMJ. 2016;352:i101; 5. Ministry of Health. Cardiovascular Disease Risk Assessment and Management for Primary Care. 2018. Available at: https://www.health.govt.nz/publication/cardiovascular-disease-risk-assessment-and-management-primary-care (Accessed Mar, 2020); 6. NZ Formulary. NZF v93. 2020. Available from: www.nzf.org.nz (Accessed Mar, 2020).