Hypertension

Case Definitions

Hypertension (HT) is a common and modifiable risk factor for cardiovascular disease (CVD) and chronic kidney disease (CKD).

Hypertension is defined as a high blood pressure (BP) >140/90 mmHg[i] on multiple measurements on 2 or more separate occasions. In at-risk populations, such as Kimberley Aboriginal people, a BP of >130/80 should prompt consideration of early intervention.

Where possible, the diagnosis of hypertension should be confirmed on out-of-clinic BP measurement (ideally with 24-hour ambulatory BP monitoring).

Patients with a BP >180/110 are at high risk for acute complications and warrant immediate review with a clinic General Practitioner, who may ask for advice from a secondary care provider.

BP measurement tips

Ensure you are using the right size cuff for the arm. This means a bladder circumference >80% and covering >40% of the upper arm. If the cuff is too small, it will give artificially high BP readings. All clinics should have both standard and large adult cuff sizes; the large cuff is suitable for most adults.

Measure the BP in a quiet environment. The patient should be seated (legs not crossed) and relaxed several minutes before measurement. Patients should ideally refrain from caffeine and smoking for 2 hours prior to measurement.

The first BP should be taken on both arms and the arm with the highest measurement should be documented and used from then on. For any patient that records an initial BP >130/80 mmHg, 3 measurements should be performed with 5-minute rests in between each.

Automated devices do not measure BP accurately in patients with an irregular pulse (e.g., atrial fibrillation). If suspected, measure manually.

NB: Do not take a BP from an arm with a working renal dialysis fistula site.

Screening

Check BP annually in everyone 15 years and over[ii]. Review BP at every subsequent visit.

ASSESSMENT

For patients with high BP, the following assessment should be undertaken by a clinician:

History:

- Identify and document cardiovascular (CV) risk factors including age, gender, Aboriginal and Torres Strait Islander status, and ethnicity.
- Ask and assess any comorbidities such as CKD, proteinuria, sleep apnoea, diabetes and dyslipidaemia, and other types of non-ischaemic heart disease such as heart failure and atrial fibrillation.
- Ask about dietary intake, specifically caffeine, energy drinks and salt.
- Ask about lifestyle factors including smoking, recreational drug use, alcohol and exercise.
- Assess family history of CVD particularly in first degree relatives aged <55 years in men and <65 years in women, or in a family member with familial hypercholesterolemia.

Physical examination:

- BP: 3 measurements at rest.
- Weight, height, waist circumference and body mass index (BMI).
- CV exam including auscultation of the heart, carotids, lungs and palpation of peripheral pulses and carotids.
- Abdominal examination (looking for signs of aortic aneurysm).
- In patients with BP >180/110 conduct a visual acuity test and fundoscopy to assess for any damage to the eyes, retinal hemorrhages and papilledema.

Investigations:

- Electrocardiogram (ECG).
- Bloods: urea and electrolytes (UECs), HbA1c.
- Urine dipstick and albumin-creatinine ratio (ACR).

NB: If you suspect patient has white coat or masked HT consider 24-hour ambulatory BP monitoring.

Calculate CVD risk:

All eligible patients (Aboriginal >35 years, non-Aboriginal >45 years).

CVD Risk Calculator **www.cvdcheck.org.au**

The probability of a CV event should be recorded to help direct an appropriate management plan.

NB: It is widely accepted that this calculator *underestimates* CV risk for Aboriginal patients. Consider it the *minimum* risk and consider other risk factors not used in the calculator such as family history and obesity.

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Principles of Management

Everyone with hypertension, regardless of drug therapy, needs appropriate lifestyle advice (see KAHPF Healthy Living Guideline):

- Encourage smoking cessation (see KAHPF Smoking Cessation Guideline).
- Encourage exercise i.e., at least 30 minutes of moderate-intensity physical activity on most, if not all, days of the week (daily total can be accumulated e.g., 3x 10-minute sessions).
- Encourage limited alcohol intake i.e., no more than 2 standard drinks per day.
- Minimise salt intake by not adding salt to food and by avoiding processed foods and take away.
- Create a target for waist measurement <94cm for men and <80cm for women and aim for a BMI <25kg/m2.
- If overweight, aim for 10% weight loss as initial target.
- Provide support and advice on reduction in caffeine, energy drink and amphetamine use.

THERAPEUTIC GOALS

The goal is to achieve control through lifestyle changes with addition of pharmacological therapy when lifestyle management is not successful.

Aim to achieve BP control within 3 months. This can be achieved more gradually in older patients or those considered at risk of symptomatic hypotension.

CVD risk should be utilised in the decision to initiate treatment. Evidence supports that patients stratified as at high absolute CV risk receive a greater benefit from BP lowering treatment than patients at lower absolute CV risk.

NB: For pregnant patients or women of childbearing age refer advice in the following pages.

For all patients with >130/80 mmHg their risks should be identified, and lifestyle advice should be provided regardless of CVD risk.

Therapeutic Protocols

BLOOD PRESSURE TARGETS

Patients with uncomplicated hypertension should be treated to a target <140/90 mmHg, or lower if tolerated.

In select high CV risk patients consider aiming treatment to targets systolic BP <120 mmHg, with closer follow up to identify treatment related adverse effects, including hypotension, syncope, electrolyte abnormalities and acute kidney injury (AKI).

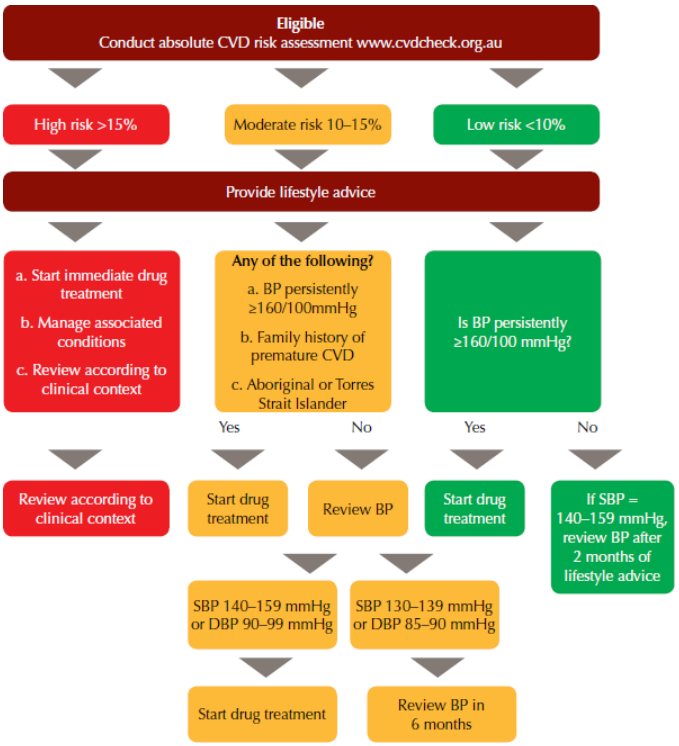

Figure 1: Treatment strategy for patients with newly diagnosed HT[iii]

MEDICATIONS

The main objective of drug therapy for BP is to prevent long-term complications of elevated BP.

Note that 50-70% of patients will not achieve BP targets with a single agent alone. **Current guidelines recommend the concurrent use of 2 antihypertensive agents from different classes to achieve BP target, rather than a single agent at maximum dose.**

A stepwise approach should be followed, and medication choice should be tailored to the needs of the patient.

Review of evidence-based guidelines such as 'Therapeutic Guidelines – HT and BP Reduction' is recommended to inform decision making.

Evidence suggests that **angiotensin converting enzyme inhibitors** (ACEi), **angiotensin II receptor blockers** (ARB), **dihydropyridine calcium channel blockers** and **thiazide diuretics** are all suitable first-line drugs for uncomplicated hypertension in non-pregnant adults, with similar efficacy.

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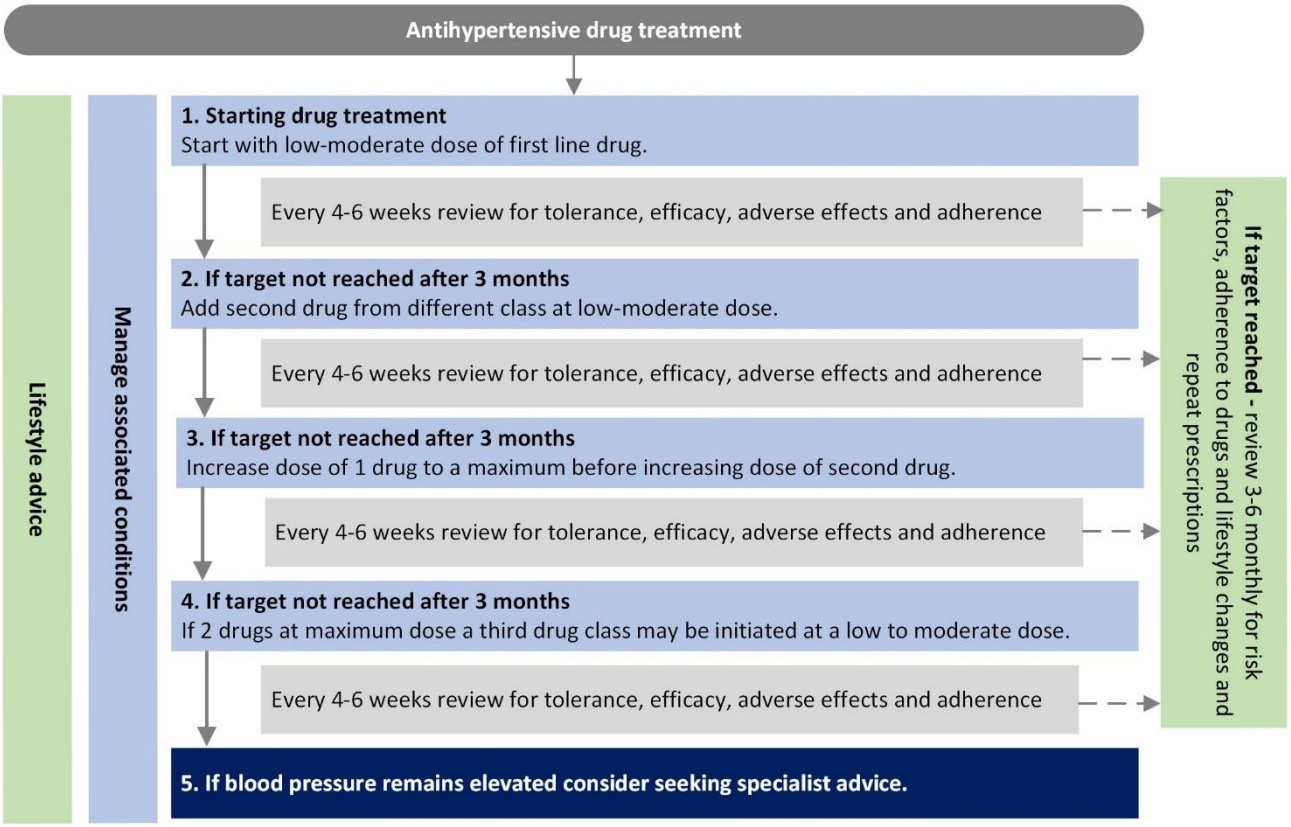

Figure 2: Drug treatment strategy to reach blood pressure target[iv]

The decision to initiate or change a patient's therapy should consider their individual risk factors, comorbidities, and degree of hypertension.

Evaluate **medication adherence** at every visit, and prior to making any changes to antihypertensive regime.

Consider strategies to improve adherence, including reducing polypharmacy with the use of single-pill combinations, recommendation of agents with once-daily dosing, and the provision of pre-packaged regular medications.

NB: Diuretic use in the Kimberley (e.g., thiazides, SGLT2i, loop diuretics)

The Kimberley is a hot and humid environment, predisposing to dehydration. This can exacerbate electrolyte disturbances and risk of AKI in setting of diuretic use. Use with caution in elderly patients and/or patients with CKD, diabetes, gout, pseudogout, existing electrolyte disturbance and those at increased risk of dehydration such as outdoor labourers. Monitor BP and electrolytes carefully. At a minimum check UECs at 4 weeks and 3 months. Consider introducing at low dose and up-titrate gradually.

Specific Patient Groups

CKD/PROTEINURIA

- Refer to KAHPF CKD Guideline.
- Consider ACEi as first line therapy.
- Use caution with thiazide diuretics as there is a risk of AKI and hyperkalemia.

ISCHEMIC HEART DISEASE (IHD)

- Refer to KAHPF IHD Guideline.
- Both ACEi and beta-blockers are advised for secondary prevention.
- Beta-blockers *or* calcium channel blockers are recommended for patients showing symptoms of angina.

HEART FAILURE

- Refer to KAHPF Heart Failure Guideline.
- ACEi and selected beta-blockers (Bisoprolol) are recommended.
- Avoid using non-dihydropyridine calcium channel blockers in this patient group.

Pregnant women who present with new onset HT (i.e., BP >140/90) should be assessed for preeclampsia and early specialist advice sought.
Pregnant women who have pre-existing HT require an early medical review before 10 weeks gestation. Aspirin 100mg daily is recommended to reduce risk of preeclampsia.

Hypertension

Secondary Hypertension

A specific cause of secondary HT can be identified in 5-10% of hypertensive patients. Those suspected to have secondary HT should be investigated with input from the local physician/cardiology team.

Indicators that may warrant investigation include:

- Severe or resistant HT (unable to reach target despite adequate doses of 3 antihypertensives).
- Acute rise in blood pressure.
- Aged <30yrs with no other risk factors for HT e.g., obesity, smoking etc.
- Accelerated HT e.g., HT with signs of end organ damage such as an AKI.
- Onset prior to puberty.

Common causes of secondary HT include:

- Renovascular disease.
- Primary kidney disease.
- Primary aldosteronism.
- Sleep apnoea syndrome.

Less common causes include:

- Combined oral contraceptive pill (COCP).
- Phaeochromocytoma.
- Cushing's syndrome.
- Coarctation of the aorta.
- Other endocrine disorders: hyperthyroidism and hypothyroidism.
- Chemotherapeutic agents.

Initial investigation for secondary HT *may* include:

- Aldosterone-renin ratio.
- Plasma free metanephrines.
- Midnight salivary cortisol.

Follow Up

A patient's BP should be measured and recorded at every visit.

For those on lifestyle management only, review at 3 months.

For those on pharmacological treatment, until treatment target is reached:

- 2-4 weekly clinical review: check BP, side-effects and compliance.
- Check UECs 2 weeks after starting or increasing the dose of ACEi, ARB, or thiazide diuretics.
- Discuss lifestyle interventions and risk factors at each visit.

Women of Childbearing Age

- Note that the COCP may contribute to an increase in BP (particularly agents with a higher dose estrogen component).
- Avoid use of COCP in uncontrolled HT and be cautious with use in any patient with HT, even if controlled.
- In these patients, long-acting reversible contraception such as the Implanon NXT®, Mirena® or Kyleena® are ideal.
- If planning a pregnancy seek physician/obstetrician advice. This will involve a review of medication, and for complications of HT. It may also require cessation of agents, or initiation of anti-hypertensive agents appropriate in pregnancy.
- ACEi and ARB are contraindicated in pregnancy and should be ceased if taking at time of confirmed pregnancy. Generally, Methyldopa or Labetalol are used (follow guidelines such as 'HT in pregnancy: medical management').

Refer/Discuss

To Physician or Cardiologist:

- Immediate advice/review if BP is >180/110 mmHg.
- HT uncontrolled despite being on 3 agents for HT.
- Suspected secondary HT.
- Intolerance or contraindications to several medications.
- Patients with severe co-morbidities.
- *Hypertensive urgency* is a severe BP elevation that is associated with symptoms (headache) or moderate target organ damage but is not immediately life-threatening. These patients are at high risk of acute complications and require immediate treatment (with oral agents where suitable) and follow up within 24-72hrs.
- *Accelerated or malignant HT* is severe HT (commonly >200/120 mmHg) associated with advanced features of retinopathy and should prompt consideration of referral to hospital emergency department where able.

To Nephrologist:

- Poorly controlled HT in patients with proteinuria (urine ACR >70mg/mmol or Protein Creatinine Ratio >100mg/mmol).

To Obstetrician:

- HT in pregnancy.
- Pregnancy planning in patients who have pre-existing HT.

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Resources

- Global HT Practice Guidelines (International Society of HT)[i]
- Guidelines for preventive activities in general practice (Red Book) (RACGP)
- HT clinical information and guidelines (Heart Foundation)
- HT in pregnancy: medical management (KEMH)
- Kimberley Clinical Protocols and Guidelines (KAHPF)
- Kimberley Standard Drug List (KSDL) (KAHPF)
- Therapeutic Guidelines

Abbreviations and Acronyms

>	Greater than
<	Less than
ACEi	Angiotensin converting enzyme inhibitors (ACEi)
ACR	Albumin-creatinine Ratio
AKI	Acute Kidney Injury
ARB	Angiotensin II receptor blockers
BMI	Body Mass Index
BP	Blood Pressure
CKD	Chronic Kidney Disease
COCP	Combined oral contraceptive pill
CV	Cardiovascular
CVD	Cardiovascular Disease
ECG	Electrocardiogram
HT	Hypertension
KAHPF	Kimberley Aboriginal Health Planning Forum
KEMH	King Edward Memorial Hospital
KSDL	Kimberley Standard Drug List
RACGP	Royal Australian College of General Practitioners
UECs	Urea and Electrolytes

Endnotes

[i] HT guidelines in Europe (2018) and Australia (2016) define HT as BP >140/90, however changes to the US guidelines (2018) recommend that review at BP >130/80 may enable earlier intervention within at-risk populations.
[ii] Medicare Benefits Schedule (MBS) recommended pro forma for annual Indigenous-specific health checks for people over 15 years includes the measurement of BP. Screening for CV risk factors in at risk Aboriginal populations is recommended to commence from age 18 years at the latest.
[iii] Reproduced from National Heart Foundation of Australia (2016:35) *Guideline for the diagnosis and management of hypertension in adults*.
[iv] Reproduced from National Heart Foundation of Australia (2016: 36) *Guideline for the diagnosis and management of hypertension in adults.*