The abridged South African hypertension guideline 2011

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Abstract

Extensive data from randomised controlled trials have shown the benefit of treating hypertension. The target blood pressure (BP) for antihypertensive management is < 140/90 mmHg, and < 130/80 mmHg in patients with end-organ damage, co-existing risk factors, and co-morbidity. Benefits of management include reduced risk of death, stroke, cardiac failure, chronic kidney disease, and coronary heart disease. The correct BP measurement procedure is described, and evaluation of cardiovascular risk factors and recommendations for antihypertensive therapy, are stipulated. Lifestyle modification and patient education are cornerstones in the management of every patient. Major indications, precautions, and contraindications to each recommended antihypertensive drug are listed. Combination therapy should be considered *ab initio* if the BP is ≥ 20/10 mmHg above goal. First-line drug therapy for uncomplicated essential hypertension includes low-dose thiazide-like diuretics, calcium-channel blockers, angiotensin-converting enzyme inhibitors, or angiotensin-receptor blockers. The guideline was developed by the Southern African Hypertension Society.

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Introduction

The objective of this guideline was to promote evidence-based, accessible, and comprehensive management of hypertension by healthcare professionals in the public and private sectors in South Africa. In developing this guideline, hypertension and cardiovascular disease (CVD) treatment and prevention guidelines were reviewed, as well as hypertension trials that reported clinical end-points, and involved individuals with important co-morbidities, such as diabetes mellitus and chronic kidney disease (CKD).

Measurement of blood pressure

Blood pressure (BP) is recorded using an approved device. The patient should remain in a sitting position for at least five minutes. An appropriately sized cuff should be used. At the initial consultation, BP should be measured in both arms, and if there is any discrepancy, it should be taken thereafter in the arm with the higher BP. First, the systolic BP should be estimated by palpation, to avoid missing the auscultatory gap.

Self-measurement of BP (SBPM) and ambulatory monitoring (ABPM) are recommended for selected target groups and circumstances:

- Suspected white-coat (higher readings in the office, compared to outside) or masked hypertension (normal readings in the office, but higher outside)
- To guide antihypertensive medication, especially in high-risk groups, e.g. the elderly or diabetics
- Refractory hypertension
- To improve compliance to treatment (SBPM only).

The advantages of SBPM measurement are improved assessment of drug effects, detection of causal relationships between adverse events and BP response, and improved compliance. However, the disadvantages are an increase in anxiety and the risk of self-medication. ABPM provides the most accurate method to diagnose hypertension, assess BP control, and predict outcome. The norms, limitations and advantages of office BP, SBPM and ABPM are summarised in Table I.

Cardiovascular disease risk stratification

The rational for assessing CVD risk is that certain risk factors confer a great risk of mortality and morbidity. The format of the CVD risk assessment is outlined in Table II. Table III lists the major risk factors, target-organ damage, and associated clinical conditions. Risk factors that are modifiable, e.g. smoking, diabetes and dyslipidaemia, should be the target of lifestyle

Table I: Different methods of blood pressure measurement

	Clinic	Home	Ambulatory
Predicts outcome	Yes	Yes	Strongly
Initial diagnosis	Yes	Yes	Yes
Cut-off blood pressure levels (in mmHg)	140/90	135/85	135/85 (mean day) 120/70 (mean night)
Evaluation of treatment	Yes	Yes	Limited, but valuable
Assess diurnal rhythm	No	No	Yes

intervention and other treatment, as appropriate. In addition to controlling hypertension, target-organ damage and associated clinical conditions must be managed appropriately, and if necessary, referred to a higher level of care.

Routine investigations

Weight, body mass index (BMI), waist circumference, dipstick urine, electrolytes, creatinine, and an electrocardiogram (ECG) are routine investigations. Apart from measurements of overweight and obesity, the tests are performed annually, unless abnormal. Abnormal results must be repeated, as clinically indicated.

Table II: Stratification of risk to quantify prognosis

	Blood pressure (mmHg)				
Other risk factors and disease history	Normal SBP 120-129 or DBP 80-84	High normal SBP 130-139 or DBP 85-89	Stage 1: Mild hypertension SBP 140-159 or DBP 90-99	Stage 2: Moderate hypertension SBP 160-179 or DBP 100-109	Stage 3: Severe hypertension SBP > 180 or DPB > 110
No other major risk factors	Average risk	Average risk	Low added risk	Moderate added risk	High added risk
1-2 major risk factors	Low added risk	Low added risk	Moderate added risk	Moderate added risk	Very high added risk
≥ 3 major risk factors, or target-organ damage, or diabetes mellitus, or metabolic syndrome	Moderate added risk	High added risk	High added risk	High added risk	Very high added risk
Associated clinical conditions	High added risk	Very high added risk	Very high added risk	Very high added risk	Very high added risk

Table III: Major risk factors, target-organ damage and associated clinical conditions

Major risk factors	Target-organ damage	Associated clinical conditions
Levels of systolic and diastolic BP **Smoking** **Dyslipidaemia** Total cholesterol > 5.1 mmol/l, or LDL > 3 mmol/l, or HDL < 1 (men) and < 1.2 mmol/l (women) **Diabetes mellitus** **Men > 55 years** **Women > 65 years** **Family history of early onset of CVD** Men aged < 55 years Women aged < 65 years **Waist circumference/abdominal obesity** Men ≥ 94 cm Women ≥ 80 cm The exceptions are South Asians and Chinese people: Men > 90 cm, and women > 80 cm	**LVH: based on ECG** Sokolow-Lyons > 38 mm Cornel > 2 440 mm/millisecond **Microalbuminuria: albumin/creatine ratio 3-30 mg/mmol** **Slightly elevated creatinine** Men 115-133 µmol/l Women 107-124 µmol/l	**Coronary heart disease** **Heart failure** **Chronic kidney disease** Albuminuria > 30 mg/mmol, or Creatinine > 133 µmol/l (men) and > 124 µmol/l (women) **Stroke or transient ischaemic attack** **Peripheral arterial disease** **Advanced retinopathy** Haemorrhages Exudates Papilloedema

Goals of blood pressure-lowering treatment

The goals of BP-lowering treatment vary according to number of major risk factors, target-organ damage, and associated clinical conditions. The BP goal is < 140/90 mmHg for uncomplicated patients, and < 130/80 mmHg for high-risk patients. This should be part of an overall strategy to reduce cardiovascular risk.

Management

The diagnosis of hypertension may be made if repeat measurements have been performed on three separate occasions, and either the initial systolic BP (SBP) is ≥ 140 mmHg, or the diastolic BP (DBP) is ≥ 90 mmHg, when taken over a period of two months. Where circumstances permit, ABPM should be considered, particularly in the absence of target-organ damage. If the SBP is ≥ 180 mmHg, or the DBP is ≥ 110 mmHg, then refer to the section on severe (stage III) hypertension.

Lifestyle information should be given to every person for whom BP is measured, but when the BP is elevated, a programme of lifestyle modification should be implemented immediately. This should include weight reduction, regular physical activity, cessation of smoking, moderation of alcohol, salt reduction, increased intake of fresh fruits and vegetables, and reduced fat. A healthy lifestyle decreases BP, enhances antihypertensive drug efficiency, and decreases total CV risk.

Drug therapy

In order to use these recommendations for treatment, it is essential that the patient's added CV risk is assessed according to Table II. The level of added CV risk informs the decision to implement drug therapy according to the decision flow chart (Figure 1.)

Drug treatment is commenced in the following cases:

- *Low added risk* where the SBP remains ≥ 140 mmHg, or the DBP remains ≥ 90 mmHg, despite a period of 6-12 months of lifestyle modification and observation.
- *Moderate added risk* where the SBP remains ≥ 140 mmHg, or the DBP remains ≥ 90 mmHg, despite a period of 3-6 months of lifestyle modification

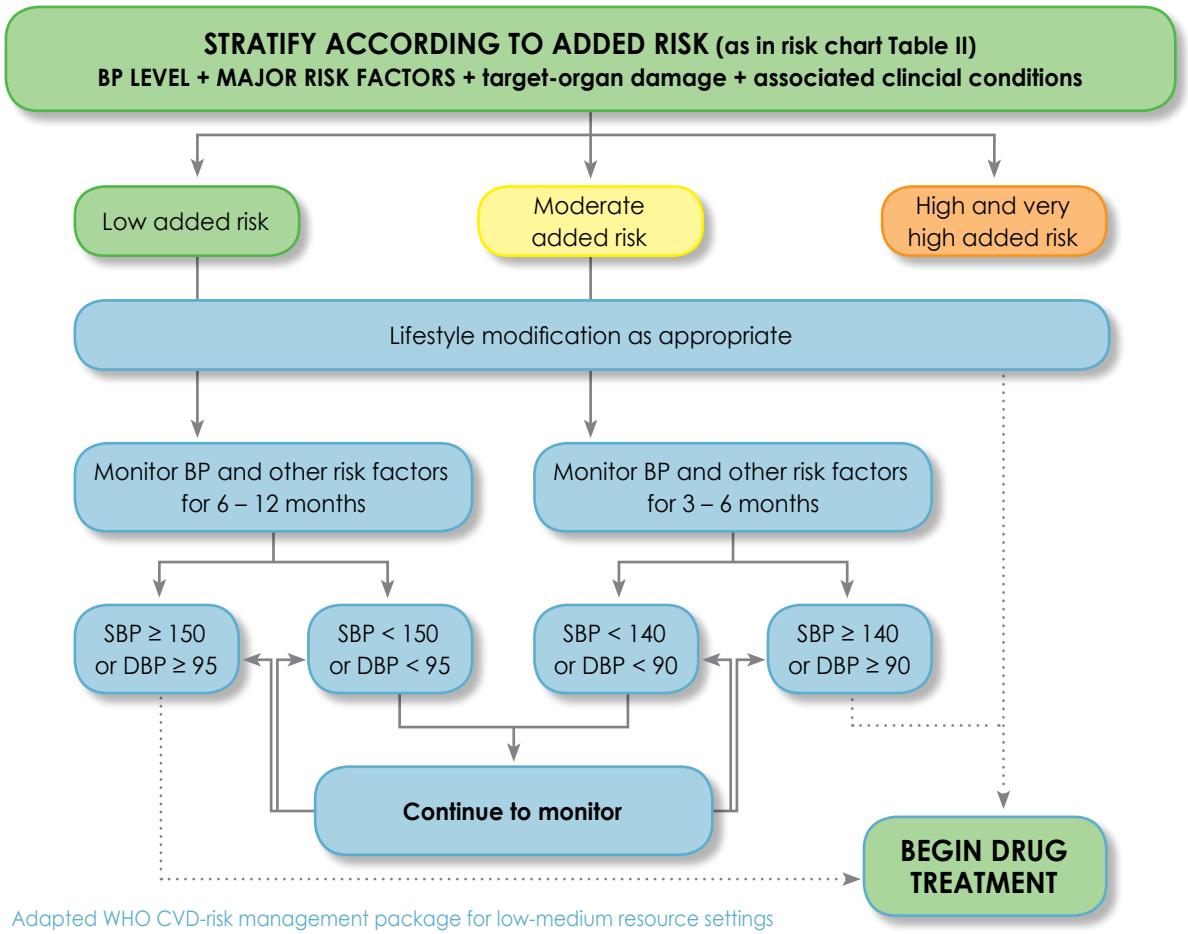

Figure 1: Southern African hypertension management flow diagram, based on added cardiovascular disease risk

and observation.

- *High or very high added risk.*

Before choosing an antihypertensive agent, allow for considerations based on the cost of the various drug classes, patient-related factors, such as the presence of major risk factors, conditions favouring use and contraindications, and associated clinical conditions and target-organ damage (Tables III, IV). In otherwise uncomplicated essential hypertension, there are three important antihypertensive agents, namely diuretics (thiazide-like and thiazide), angiotensin-converting enzyme (ACE) inhibitors or angiotensin-receptor blockers (ARBs), and calcium-channel blockers. Therapy should be initiated with either a diuretic, angiotensin-converting enzyme (ACE) inhibitor or angiotensin-receptor blocker (ARB), or calcium-channel blocker. Combination therapy should be considered *ab initio* if BP is ≥ 20/10 mmHg above goal with either an ACE inhibitor or ARB and diuretic; ACE inhibitor and calcium-channel blocker; or calcium-channel blocker and diuretic. In black hypertensive patients, a good combination would be a thiazide-like diuretic with a calcium-channel blocker. Fixed- drug combinations are preferred. If control is not achieved with monotherapy, combination therapy should be instituted with another drug from the first-line classes.

Table IV: Indications and contraindications for the major classes of antihypertensive drugs

Class	Conditions favouring the use	Contraindications	
		Compelling	Possible
Diuretics (thiazide, thiazide-like)	Heart failure Elderly hypertensives Ischaemic heart disease Hypertensives of African origin	Gout	Pregnancy Beta blockers (especially atenolol)
Diuretics (loop)	Renal insufficiency Heart failure	Not used in other hypertensives	Pregnancy
Diuretics (anti-aldosterone)	Heart failure Post-myocardial infarction Resistant hypertension	Renal failure Hyperkalaemia	
Calcium-channel blockers: long acting only (dihydropyridine)	Elderly patients Isolated systolic hypertension Angina pectoris Peripheral vascular disease Carotid atherosclerosis Pregnancy		Tachyarrhythmias Heart failure
Calcium-channel blockers: non-dihydropyridine (verapamil and diltiazem)	Angina pectoris Carotid atherosclerosis Supraventricular tachycardia	Atrioventricular block (grade 2 or 3) Heart failure	Constipation (verapamil)
Angiotensin-converting enzyme inhibitors	Heart failure Left ventricular dysfunction Post-myocardial infarction Non-diabetic nephropathy Type 1 diabetic nephropathy Prevention of diabetic micro-albuminuria Proteinuria	Pregnancy Hyperkalaemia Bilateral renal artery stenosis Angioneurotic oedema (more common in black than in Caucasian individuals)	
Angiotensin-receptor blockers	Type 2 diabetic nephropathy Type 2 diabetic micro-albuminuria Proteinuria Left ventricular hypertrophy ACE inhibitor cough or intolerance	Pregnancy Hyperkalaemia Bilateral renal artery stenosis	
Beta blockers	Angina pectoris Post-myocardial infarction Heart failure (some, must up-titrate) Tachyarrhythmias	Asthma Chronic obstructive pulmonary disease Atrioventricular block (grade 2 or 3) Pregnancy (atenolol)	Peripheral vascular disease Bradycardia Glucose intolerance Metabolic syndrome Athletes and physically active patients Non-dihydropyridine calcium-channel blockers (verapamil and diltiazem)

Management of severe hypertension

Patients with severe hypertension (Stage 3 DBP ≥ 110 mmHg, or SBP ≥ 180 mmHg) may fall into one of three categories which determine the urgency of their treatment. Sustained severe hypertension requires immediate drug therapy, and lifestyle modification must be followed as soon as possible.

Asymptomatic severe hypertension

These patients are asymptomatic, but have severe hypertension with, or without, evidence of progressive target-organ damage or associated clinical conditions. The patient must be kept in the care setting and BP measurement repeated after resting for one hour. If the second measurement is still elevated at the same level, oral therapy should be started, using two drugs together, one of which should be a low-dose thiazide-like diuretic. The other is usually a dihydropyridine calcium-channel blocker. Follow-up should take place within a week or earlier, with escalation of treatment as needed. Early referral is advised if BP is not controlled within two to four weeks.

Hypertensive urgency

This level of hypertension is symptomatic, usually with severe headache, shortness of breath and oedema. There are no immediate life-threatening neurological, renal, eye or cardiac complications, such as are seen in hypertensive emergencies. Ideally, all patients with hypertensive urgency should be treated in hospital.

Commence treatment with two oral agents, and aim to lower the DBP to 100 mmHg slowly, over 48-72 hours.

This BP lowering can be achieved with the use of:

- Long-acting calcium-channel blockers
- An ACE inhibitor, initially used in very low doses, but which should be avoided if there is severe hyponatraemia (serum Na < 130 mmol/l indicates hyperreninaemia, and BP may fall dramatically with an ACE inhibitor).
- Beta blockers.
- Diuretics may potentiate the effects of the other classes of drugs when added.

Hypertensive emergency

A hypertensive emergency exists when acute elevation of BP is associated with acute and ongoing damage to the kidneys, brain, heart, eyes (grade 3 or 4 retinopathy), or vascular system. These patients need rapid (within minutes to a few hours) lowering of BP to safe levels. Immediate hospitalisation is essential, in an intensive care unit. Intravenous antihypertensive therapy, tailored to the specific type of emergency, has become the standard of care. The potential for harm from overzealous lowering of BP exists concurrently with the need for careful and structured BP reduction.

Bibliography

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