HYPERTENSION MANAGEMENT ALGORITHM

STEP 1 Assess

MAJOR RISK FACTORS

- Levels of systolic and diastolic BP.
- Smoking.
- Dyslipidaemia:
  - total cholesterol > 6.5 mmol/L, **OR**
  - LDL > 4 mmol/L **OR**
  - HDL men < 1 and women < 1.2 mmol/L
- Diabetes mellitus.
- Men > 55 years.
- Women > 65 years.
- Family history of early onset of cardiovascular disease:
  - Men aged < 55 years
  - Women aged < 65 years.
- Waist circumference - abdominal obesity:
  - Men > 102cm;
  - Women > 88cm.

The exceptions are South Asians and Chinese: Men: > 90cm and Women: > 80cm.

TARGET ORGAN DAMAGE

- Left ventricular hypertrophy: based on ECG
  - Sokolow-Lyons - S in V1 plus R in V5 + V6 ≥ 38mm
  - Cornel - (S in V3 + R in avL + 6 in females) X QRS duration > 2440mm.ms
- Microalbuminuria: albumin creatinine ratio 3-30 mg/mmol.
- Slightly elevated creatinine:
  - men 115-133 µmol/L;
  - women 107-124 µmol/L

ASSOCIATED CLINICAL CONDITIONS

- Coronary heart disease.
- Heart failure.
- Chronic kidney disease: albumin creatinine ratio >30mg/mmol.
- Stroke or transient ischaemic attack.
- Peripheral arterial disease.
- Advanced retinopathy:
  - haemorrhages **OR** exudates, papilloedema.

STEP 2 Measure Blood Pressure

Other risk factors and disease history	NORMAL SBP 120-129 OR DBP 80-84 mmHg	HIGH NORMAL SBP 130-139 OR DBP 85-89 mmHg	STAGE 1 MILD HYPERTENSION SBP 140-159 OR DBP 90-99 mmHg	STAGE 2 MODERATE HYPERTENSION SBP 160-179 OR DBP 100-109 mmHg	STAGE 3 SEVERE HYPERTENSION SBP > 180 OR DBP > 110 mmHg
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	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

STEP 3 Determine Risk

- LOW ADDED RISK
- MODERATE ADDED RISK
- HIGH / VERY HIGH ADDED RISK

STEP 4 LIFESTYLE MODIFICATION

- Weight reduction
- Dietary sodium reduction
- Restrict alcohol consumption
- Limit total fat intake
- Increase fruit and vegetable consumption
- Limit free sugars
- Physical activity
- Stop using all tobacco products

LIFESTYLE MODIFICATION AS APPROPRIATE

- Monitor BP & other risk factors for 6 - 12 months
  - SBP ≥140 or DBP ≥90
  - SBP <140 or DBP <90
- Monitor BP & other risk factors for 3 - 6 months
  - SBP <140 or DBP <90
  - SBP ≥140 or DBP ≥90

Continue to monitor

STEP 5 BEGIN DRUG TREATMENT

STEP 6

Is there SEVERE HYPERTENSION? SBP > 180 OR DBP > 110 mmHg

- YES → Consider referral to specialist
- NO → ARE THERE COMPELLING INDICATIONS?

STEP 7

ARE THERE COMPELLING INDICATIONS?

- YES → Go to Step 8
- NO → Go to Step 8

COMPELLING INDICATIONS	DRUG CLASS
Angina.	Beta-blocker **OR** CCB (rate lowering preferred.)
Prior myocardial infarct.	Beta-blocker **AND** ACE-I (ARB if ACE-I intolerant) Verapamil if beta-blockers contraindicated. If heart failure see below.
Heart failure.	ACE-I (ARB if ACE-I intolerant) **AND** certain beta-blockers **AND** aldosterone antagonist. For combination ARB **AND** ACE-I see guideline. Loop diuretics for volume overload.
Left ventricular hypertrophy (confirmed by ECG).	ARB (preferred) **OR** ACE-I
Stroke: secondary prevention.	ACE-I plus diuretic **OR** ARB
Diabetes type 1 or 2 with or without evidence of microalbuminuria or proteinuria.	ACE-I **OR** ARB - usually in combination with a diuretic
Chronic kidney disease.	ACE-I OR ARB - usually in combination with a diuretic
Isolated systolic hypertension.	Low-dose thiazide or thiazide-like diuretic **OR** long-acting CCB.

STEP 8 Routine Management

STEP 1:	Low-dose hydrochlorothiazide (12.5 mg preferred up to max 25mg) **OR** thiazide-like diuretic.
STEP 2 AND STEP 3:	ACE-I (in ACE-I intolerance use ARBs); **OR** CCB long-acting dihydropyridines **OR** non-dihydropyridines.
STEP 4 RESISTANT HYPERTENSION:	Direct vasodilators: hydralazine, minoxidil; Centrally acting drugs: methyldopa, moxonidine; Alpha blocker: doxazosin: Beta blockers: many cardio-selective agents are available; Aldosterone antagonist.

STEP 9 BP targets

TARGETS FOR BP-LOWERING TREATMENT

Ideally these targets should be reached in 3 months

Stage	BP level (mmHg)
All stages	< 140/90
Isolated Systolic Hypertension	Do not lower the DBP to < 65
High-risk patients	< 130/80

Southern African Hypertension Society