NATIONAL GUIDELINE

UPDATED MANAGEMENT OF HYPERTENSION IN ADULTS AT PRIMARY CARE LEVEL

DECEMBER 2006

health
Department:
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REPUBLIC OF SOUTH AFRICA

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UPDATED MANAGEMENT OF HYPERTENSION IN ADULTS AT PRIMARY CARE LEVEL

DEPARTMENT OF HEALTH
DIRECTORATE:CHORNIC DISEASES, DISABILITIES AND GERIATRICS

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ABREVIATIONS

ACC	-	Associated Clinical Conditions
ACE-I	-	Angiotensin-Converting Enzyme Inhibitor
ARB	-	Angiotensin Receptor Blocker
BMI	-	Body Mass Index
BP	-	Blood Pressure
CAD	-	Coronary Artery Disease
CCB	-	Calcium Channel Blockers
CVD	-	Cardio Vascular Disease
DBP	-	Diastolic Blood Pressure
HDL	-	High Density Lipoprotein
MI	-	Myocardial Infarct
NCDs	-	Non-Communicable Disease
ISH	-	Isolated Systolic Hypertension
SBP	-	Systolic Blood Pressure
TIA	-	Transient Ischaemic Attack
TOD	-	Target Organ Damage
WHO	-	World Health Organisation

INTRODUCTION

Hypertension is a major public Health problem in virtually all parts of the world, as well as in South Africa. (Hypertension in pregnancy is addressed in Guidelines for Maternal Care in SA)

A consistent blood pressure (BP) above 140/90 mmHG carries an increased risk for hypertension-associated disease such as strokes and heart attacks. The World Health Organisation (WHO) defines 'being hypertensive' as having a blood pressure higher than 140/90 mmHG. The relationship between BP and risk of cardiovascular disease (CVD) events is continuous, consistent and independent of other risk factors. The risk of a given level of blood pressure is magnified by other risk factors – obesity, unhealthy nutrition, diabetes mellitus, excessive alcohol intake, physical inactivity and smoking.

These risk factors are primarily the results of following an unhealthy lifestyle, either by making wrong choices, or in part, not having a choice and emphasises the societal character of the problem. Effective management of hypertension is further complicated by the asymptomatic nature of the condition and requires high levels of compliance.

Primary health care services should be the stronghold of hypertension control.

GOAL OF THE GUIDELINE

To improve prevention and effective management of hypertension, with ultimate reduction of cardiovascular and renal morbidity and mortality.

OBJECTIVES OF THE GUIDELINE

1. To achieve primary prevention of high blood pressure through an integrated risk management process by following a population approach.
2. To achieve target level blood pressure by rational, effective, comprehensive management of hypertension.
3. To achieve secondary prevention of cardiovascular disease, cerebrovascular disease, renal and retinal damage associated with hypertension through the application of an "at risk" approach.

TAGET POPULATION

Relevant health professionals trained to manage hypertension.

PRIMORDIAL PREVENTION

Prevention of hypertension depends on the adoption of strict life style measure. The main objective is to avoid or decrease the social, economic and cultural determinants that contribute to development of hypertension. Primordial prevention relies on health policies that create a congenial environment which promote healthy behaviours and population wide education programmes. They depend, in turn, on many factors, including political commitment, advocacy by health professionals and involvement of community leaders and the mass media.

TARGET BP FOR HYPERTENSIVE PATIENTS

Normal	130/85
With co-morbidity	<130/80
Without co-morbidity	<140/90
Congestive heart failure	<120/80

If BP target have been maintained for a year, follow-up visits for assessment should be at 6 monthly intervals.

MANAGEMENT OF HYPERTENSION

1. History taking and physical examination
2. Routine investigations
3. Cardiovascular Disease (CVD) risk stratification
4. Non-drug Treatment
5. Drug treatment
6. Referrals

1. MEDICAL HISTORY AND PHYSICAL EXAMINATION

A good medical history and observations made during physical examination, together with the results recorded from routine investigations, are essential to the process of **risk identification**.

Accurate assessment of blood pressure is essential.
Refer Annexure B – Generic blood pressure (BP) measurement principles

The health care provider should provide to the patient, verbally or in writing, the specific BP reading and the BP goal.

2. ROUTINE INVESTIGATIONS

TABLE 1: Investigations and Frequency

INVESTIGATIONS	FREQUENCY OF INVESTIGATIONS	COMMENTS
BODY WEIGHT / OVERWEIGHT		
• Body weight	Every visit.	
• Height	First visit	
• Body mass index	Every visit.	<25 for men and women. Use supplied body mass index chart (Annexure A) and define level of obesity
ABNOMINAL OBESITY • Waist Circumference OR • Waist-to-hip ratio	Every visit.	Use correct method of measurement Men <102 cm; Women <88 cm. (South Asians and Chines: Men: >90 cm and Women: >80 cm.) The waist to hip ratio has greater predictive value than body mass index or waist circumference for MI but may not be practical in many settings.
OTHER TESTS		
Blood pressure	Every visit	If controlled for 12 months, then measure BP every 6 months
Eye tests	First visit Yearly if normal.	
Dietary compliance	Every visit	
Activity levels	Every visit.	
URINE DIPSTICK ROUTINE		
• Protein. • Blood. • Sugar.	First visit. Yearly if normal, if abnormal repeat at next visit	**ABNORMAL DIPSTICK** Any one of the following: • Proteinuria ≥2⁺; • Haematuria ≥1⁺. Refer for immediate further investigations.
MICRO-ALBUMINURIA Diabetes mellitus only and selected hypertensives only.	First visit then yearly.	Performed on diagnosis of type 2 diabetes mellitus or 5 years after the diagnosis of type 1.

BLOOD TESTS		
• Creatinine • Potassium	First visit. Yearly if normal.	From serum creatinine calculate Glomerular filtration rate.
Glucose (fasting preferred.)	First visit. Yearly if normal. **Every visit** if diabetes is diagnosed.	Consider glucose tolerance test in patients with abnormal fasting glucose of 5.6 – 7.0 mmol/L.
Non-fasting (random) total cholesterol.	First visit. Yearly if normal.	Measure fasting Lipogram if Cholesterol >5.1 mmol/L or in high-risk groups.
ECG (resting)	Yearly if normal.	

If a secondary cause of hypertension is suspected at first visit or if refractory hypertension exists, additional investigations should be performed as necessary and patient should be referred to higher level.

3. CARDIOVASCULAR DISEASE (CVD) RISK STRATIFICATION

Poorly managed hypertension, with the undesirable consequences of heart failure, stroke and chronic renal failure, is not acceptable. It is therefore essential that the patient's cardiovascular risk is assessed.

Cardiovascular risk factors and established target organ damage or disease should be managed appropriately. If not possible to treat at primary level, refer to hospital level.

Identification of risk relies heavily on a good medical history and observations made during the physical examination and recording of vital signs.

A) Major risk factors for cardiovascular disease

- Raised blood pressure
- Diabetes Mellitus
- Smoking
- Dyslipidemia (significantly high blood cholesterol level);
  Low-density lipoprotein (LDL) >3.0 mmol/L,
  Total cholesterol >6.5 mmol/L,
  HDL women <1.29 and men <1.03 mmol/L).
- Men >55 years
- Women >65 years or post-menopausal women
- Family history of primary hypertension or early onset of cardiovascular disease (men <55 years or women <65 tears)

B) Existing target organ damage or associated clinical conditions

If suspected, refer for assessment and appropriate management at relevant health level

- Left ventricular hypertrophy (LVH)
- Coronary heart disease
- Heart failure
- Stroke or transient ischaemic attack (TIA)
- Chronic kidney disease (albumin creatinine ratio >30 mg/mmol)
- Peripheral arterial disease
- Retinopathy – exudates and/or haemorrhages and/or papilloedema

C) METABOLIC SYNFROME

Metabolic syndrome can be identified when 3 or more of the following risk factors exist:

- Obesity- BMI≥30
  Central obesity waist circumference of ≥102 cm in men and ≥88 cm in women.
- Raised blood pressure ≥ 130/85 mmHg
- Fasting glucose ≥6.1 mmol/L
- Prediabetes-impaired glucose tolerance
  - 2h post glucose load whole blood normal
  - Venous ≥6.7 - <10 mmol/L
  - Capillary ≥7.8 - <11.1 mmol/L
- Triglycerides
  - Raised fasting >1.5 mmol/L
  - Non-fasting ≥1.7 mmol/L ≤
- HDL cholesterol <1.2 (men <1.03; women <1.29 mmol/L)

Risk Management

Risk prevention strategies should be integrated and complementary

- Population-based interventions will either prevent the emergence of risk factors (primordial prevention) or control their impact (primary prevention)
- Strategies should control proximal rather than distal risks to health
- High risk factor interventions are required for secondary and tertiary prevention

The cardiovascular disease risk assessment model, developed by the European Hypertension Society and the European Society of Cardiology, identifies average risk, low added risk, moderate added risk, high added risk and very high added risk.

Refer Table 2: Stratification of Risk to Qualify Prognosis.

TABLE 2: STRATIFICATION OF RISK TO QUALIFY PROGNOSIS

Based on the European Society of Hypertension / European Society of Cardiology Guidelines

	BLOOD PRESSURE (mm Hg)				
Other risk factors and disease history	**NORMAL SBP 120-129 OR DBP 80-84**	**HIGH NORMAL SBP 130-139 0R 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 DBP >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 factor or target organ damage (TOD) or diabetes mellitus	Moderate added risk	High added risk	High added risk	High added risk	Very high added risk
Associated clinical conditions (ACC)	High added risk	Very high added risk	Very high added risk	Very high added risk	Very high added risk

4. NON DRUG TREATMENT (LIFESTYLE MODIFICATION)

Therapeutic Education for patients (Refer Annexure C)

The Department of Health and Southern African Hypertension Society reiterate in the strongest possible terms the importance of lifestyle modification at all stages of hypertension management. Lifestyle modification decreases BP, enhances anti-hypertension drug efficiency and decreases cardiovascular risk.

a) Weight reduction in the overweight patient.
Normal body weight = BMI 18.5 – 24,9 (BMI chart Annexure A)

*To measure waist circumference, locate top of right iliac crest. Place a measuring tape in a horizontal plane around abdomen at level of iliac crest. Before reading tape measure, ensure that tape is snug but does not compress the skin is parallel to floor. Measurement is made at the end of a normal expiration.

b) Stop smoking

c) Limit total salt intake (dietary sodium)

Total salt intake should be less than 5 grams (one teaspoon) per day.
A high salt intake is directly associated with high blood pressure.
Ensure that salt is iodised.

Refer 'National Guideline: Prevention and Management of Overweight and Obesity in South Africa'.

d) Reduce alcohol intake to a maximum of 2 standard drinks per day for men and 1 standard drink per day for women.

A standard drink contains about 10 gm of ethanol and is found in 25ml spirits (whisky, brandy), 125 ml of wine and 340 ml of beer, 60 ml sherry and 25 ml liqueur. To stop alcohol consumption is preferred.

e) Follow a prudent diet (low fat, high fibre, fish instead of red meat, unrefined carbohydrates, and a diet rich in fresh vegetables and fruit (5 servings per day).

f) Regular moderate physical activity (e.g. 30 minutes brisk walking, cycling most days of the week).

g) Reduce caffeine intake.

h) If hypertensive, abstain from eating liquorice as it causes reversible sodium retention and potassium loss leading to hypertension, water retention and electrolyte imbalance.

5. DRUG TREAMENT

There are three important classes of antihypertensive agents for the management of persons with hypertension, who do not have compelling indications for a specific drug class:

- diuretics (thiazide-like and thiazide),
- angiotensin converting enzyme inhibitors (ACE-I) and
- calcium channel blockers (CCB) long-acting dihydropyridines or non-dihydrophyridines.

5.1 STEP-WISE APPROACH

STEP 1

ENTRY TO STEP 1	TREATMENT	TARGET	CONTRA INDICATIONS
• DBP 90-99 mmHg and SBP 140-159 mmHg without co-existing disease and no CVD risk factors	• Lifestyle modification	• BP control within 6 months to less than 140/90 mmHg	N/A

STEP 2

ENTRY TO STEP 2	TREATMENT	TARGET	CONTRA INDICATIONS
• DBP 90.99mmHg and SBP 140-159 mmHg and failure of lifestyle modification after 6 months • With 1 or 2 CVD risk factors OR • With ≥ 3 CVD risk factors or TOD or co-existing disease especially diabetes OR • DBP ≥ 100 mmHg and/or SBP ≥ 180 mmHg at diagnosis	• Lifestyle modification and • Low dosage Hydrochlorothiazide oral, 12,5 mg daily • Treat existing disease, if applicable with appropriate drug class (refer 5.3)	• BP control within 3 months to less than 140/90 mmHg • BP control less than 130/80 mmHg with co-morbidity	Gout, pregnancy, severe liver and renal impairment

STEP 3

ENTRY TO STEP 3	TREATMENT	TARGET	CONTRA INDICATIONS
• Failure of step 2 after 3 months	• Lifestyle modification and • Low dosage hydrochlorothiazide oral 12.5 mg daily **Add** • Beta-adrenergic blocking agent if not contra-indicated NOTE: If Beta-adrenergic blocking agent is contraindicated use drugs indicated in step 4 • Treat existing disease, if applicable, with appropriate drug class (refer 5.3)	• BP control within 3 months to less than 140/90 mmHg • BP control less than 130/80 mmHg with co-morbidity	Gout, pregnancy, severe liver and renal impairment Asthma and chronic obstructive airways disease, peripheral vascular disease, bradycardia; pulse rate less than 50 per minute

STEP 4

ENTRY TO STEP 4	TREATMENT	TARGET	CONTRA INDICATIONS
Failure of step 3 after 3 months of compliance	• Lifestyle modification and • Low dosage hydrochlorothiazide oral 12.5 mg daily and • Beta-adrenergic blocking agent (e.g. atenolol oral, 50 mg daily) if not contra-indicated Add either • An ACE-inhibitor or • A long acting dihydropyridine calcium channel blocker (CCB)	• BP control within 1-2 months to less than 140/90 mmHg with no side-effects • BP control less than 130/80 mmHg with co-morbidity	Gout, pregnancy, severe liver and renal impairment Asthma and chronic obstructive airways disease, peripheral vascular disease, bradycardia pulse rate less than 50 per minute Pregnancy history of angio oedema – aortic valve stenosis

STEP 5

ENTRY TO STEP 5	TREATMENT	TARGET	
• Failure of step 4 after 2 months of compliance (Resistant hypertension)	• If no response to step 4, refer to doctor or hospital level to identify the cause of resistant hypertension	• BP control without side-effects as soon as possible	

The benefits of combination therapy should include

- an enhanced antihypertensive effect,
- a better response rate,
- fewer adverse effects,
- reduced metabolic effects and
- improved outcomes.

The combination of a thiazide diuretic with a beta-blocker should be discouraged, especially where there is abdominal obesity combined with hypertension, as both classes of drugs have adverse metabolic consequences and increase the risk of new diabetes.

5.2 INDICATIONS AND CONTRAINDICATIONS FOR THE MAJOR CLASSES OF ANTIHYPERTENSIVE DRUGS

Adapted from the JNC 7 guidelines.

CLASS	CONDITIONS FAVOURING THE USE	CONTRAINADICATIONS	
		COMPLELLING	POSSIBLE
DIURETICS (thiazide; thiazide-like	• Heart failure • Elderly hypertensives; • Isolated systolic hypertension • Hypertension of African origin	• Gout	• Pregnancy • Beta-blockers (especially atenolol.)
DIURETIS (loop)	• Renal failure • Heart failure	Not used in other hypertensives.	• Pregnancy
DIURETICS (anti-aldosterone)	• Heart failure • Post-myocardial infarction; • Resistant hypertension	• Renal failure; • Hyperkalaemia	
CCB LONG ACTING ONLY (dihydropyridine)	• Elderly patients; • Isolated systolic hypertension; • Angina pectoris; • Peripheral vascular disease; • Carotid atherosclerosis; • Pregnancy.		• Tachyarrhythmias; • Heart failure • Antiretroviral therapy.
CCB non-dihydropyridine (verapamil, diliazem)	• Angina pectoris; • Carotid atherosclerosis • Supraventricular tachycardia	• Atrioventricular block (grade 2 or 3); • Heart failure	• Constipation (verapamil.) • Antiretroviral therapy.
ACE-Is	• Heart failure • Left ventricular dysfunction; • Post-myocardial infarction; • Non-diabetic nephropaty • Type I diabetic nephropathy; • Prevention of diabetic microalbuminuria; • Proteinuria	• Pregnancy; • Hyperkalaemia; • Bilateral renal artery stenosis	
ARBs	• Type 2 diabetic nephropathy; • Type 2 diabetic microalbuminuria; • Proteinuria; • Left ventricular hypertrophy; • ACE-I cough or intolerance	• Pregnancy; • Hyperkalaemia; • Bilateral renal artery stenosis	
BETA-BLOCKERS	• Angina pectoris; • Post-myocardial infection; • Heart failure (only some beta-blockers; must up-titrate); • Tachyarrhythmias.	• Asthma; • Chronic obstructive pulmonary disease; • Atrioventricular block (grade 2 or 3)	• Peripheral vascular disease; • Bradycardia; • Glucose intolerance; • Metabolic syndrome; • Athletes and physically active patients • Non dihydropyridine CCBs (verapamil, diltiazem); • Pregnancy.

Note: in resistant (refractory) hypertension centrally acting agents (selective and non-selective) and α blockers may be required to control BP

5.3 RECOMMENDATION ON COMPELLING INDICATIONS FOR A SPECIFIC DRUG CLASS

Any drug that lowers BP, unless absolutely contraindicated, will confer protection against established CVD/TOD. However, the following classes of drugs have additional protective properties in the case of the listed diseases/conditions.

COMPELLING INDICATIONS	**DRUG CLASS**
Angina	β-blocker
Post myocardial infarct or CAD	ACE – I (ARB if ACE not tolerated)
Heart failure	ACE – I (may add ARB), β-blocker + Diuretics (furosemide and spironolactone)
Left ventricular hypertrophy	ARB preferred or ACE – 1
Stroke	Low dose diuretic + ACE - 1
Type 1 diabetes with or without proteinuria	ACE + ***Usually in combination with a diuretic***
Type 2 diabetes with microalbuminuria	ACE – I or ARB + ***Usually in combination with a diuretic***
Type 2 diabetes with or without proteinuria	ACE – I or ARB + ***Usually in combination with a diuretic***
Isolated systolic hypertension (ISH)	Low dose thiazides + CCB

All patients with established coronary heart disease and post ischaemic stroke or TIA should be treated with aspirin (75-300mg per day) in the absence of clear contra-indications.

5.4 ONGOING MANAGEMENT

a) Dose titration or stepwise increase to maximum dosage is proposed if blood pressure is not controlled on current dosage.
b) Once a stable target blood pressure is achieved for 1 year, follow-up visits for medical assessment should be performed every six months.
c) Drug dose should be reduced if the patient presents with symptoms of postural hypotension, i.e. dizziness or SBP too low on standing.
d) Consider stepwise reduction of the anti-hypertensive drugs if hypertension is well controlled for one year.

5.5 SPECIAL CASES

5.5.1 Isolated systolic hypertension (ISH)

SBP > 140 mmHg with normal DBP in persons older than 50 years is a risk factor for CVD. If SBP > 160 mmHg manage with low dose thiazide and/or CCB.

5.5.2 Patients with Stroke

Do not lower the blood pressure in acute stroke. Acceptable blood pressure levels are DBP ≤ 120 mmHg and SBP ≤ 230 mmHg.

Only lower blood pressure if emergency hypertensive complications are present. (e.g pulmonary oedema, aortic dissection). A blood pressure drop of more than 15% in 24 hours is likely to extend the infarct. Avoid parenteral and sublingual routes.

If patient is unable to swallow, parenteral drug may be warranted provided this takes place in high-care or ICU setting.

5.5.3 Patients with HIV AND AIDS

Prolonged highly active anti-retroviral therapy (HAART) is associated with a higher prevalence of systolic hypertension. This suggests that individuals taking HAART may be at increased risk of developing hypertension-related conditions and underscores the importance of BP monitoring of these individuals.

The metabolism of CCBs is variably influenced by antiretroviral drugs; hence frequent blood pressure and dose-checks are advised. (Non-nucleoside reverse transcriptase inhibitors promote metabolism of CCBs, thus potentially reducing the antihypertensive effect, whilst protease-inhibitors increase CCB blood levels with a risk of hypotension)

The metabolism of beta-blockers may be influenced by protease inhibitors:

6. REFERRALS

6.1 URGENT referral:
Hypertensive emergency

A hypertensive emergency exists when acute elevation of BP (most adult cases will have SBP > 240 mm Hg and/or DBP >140 mm Hg) is associated with acute and on-going organ damage in 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.

Give ACE-inhibitor stat
Refer urgently for hospital admission.
ACE-inhibitor can be repeated within 60 hours.

A hypertensive emergency requires immediate hospitalisation in an intensive care unit with experienced staff and modern facilities for monitoring.

Hypertensive emergencies are uncommon and probably occur in less than 1 – 2% of the hypertensive population. Hypertensive emergencies are more common among blacks and older patients.

Hypertensive emergencies are poorly understood in terms of initiating factors, but a rapid rise in BP associated with increased vascular resistance is suspected as the initial derangement. Smoking has long been suspected to be risk factor for the development of hypertensive emergencies and smokers have five times the risk of developing malignant hypertension.

6.2 Refer within 1 (one) week
Hypertensive Urgency

This level of hypertensive 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 the hypertensive emergencies above, but there may be mild acute organ damage.

- Hypertensive patients:
  - With existing or suspected disease not able to be managed at primary level
  - Aged 18-30 years
  - With abnormal urine dipstick results: protein ≥2+, blood > 1+.
  - With pregnancy-induced hypertension

- If DBP ≥ 110 mm Hg or SBP ≥ 180 mm Hg and the patient is asymptomatic. Start drug therapy – hydrochlorothiazide and ACE-inhibitor.
- BP inadequately controlled after two months **compliance** on Step 4 drugs. (‘Resistant hypertension’)
  NB: Check compliance before reaching this conclusion.
- If severe drug side-effects develop.

Ideally, all patients with hypertensive urgency should be treated in hospital.

Thrombotic (ischemic) stroke and intracerebral haemorrhage should be managed according to the National Guideline on Stroke and Transient Ischaemic Attack.

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 by:

- Long-acting CCB;
- ACE-I are initially used in very low doses. Avoid ACE-I if there is severe hyponatraemia (serum Na < 130 mmol/l indicates hyper-reninaemia and BP may fall dramatically with ACE-I);
- Beta-blockers;
- Diuretics; may potentiate the effects of the other classes of drugs when added. Furosemide should be used if there is renal insufficiency or signs of pulmonary congestion.

Long-term follow-up and control of cardiovascular risk factors are necessary in all patients with hypertensive emergencies and urgencies.

6.3 RESISTANT (REFRACTORY) HYPERTENSION.

Hypertension that remains > 140/90 mmHg despite the use of three antihypertensive drugs, including a diuretic, which are in a rational combination, at full dose, is known as resistant or refractory hypertension.

In older patients with isolated systolic hypertension, resistant hypertension is diagnosed when triple therapy (as above) has failed to control the BP <160/90 mmHg.

A fourth line drug should only be considered after issues relating to lifestyle and adherence to therapy has been satisfactory managed.

Resistant hypertension should be managed by specialist physicians, where possible.

The therapeutic plan must include lifestyle measure. The commonest cause of resistant hypertension in South Africa is probably non-adherence or of compliance to lifestyle modification and medication. (Reasons may include the unavailability of medication, other drug related causes and patient irresponsibility.)

Causes of Resistant Hypertension (Refer Annexure D)

ANNEXURE A

BMI CHART

BODY MASS INDEX TABLE

$$BMI = \frac{\text{Weight (Kg)}}{\text{Height}^2\ (m^2)}$$

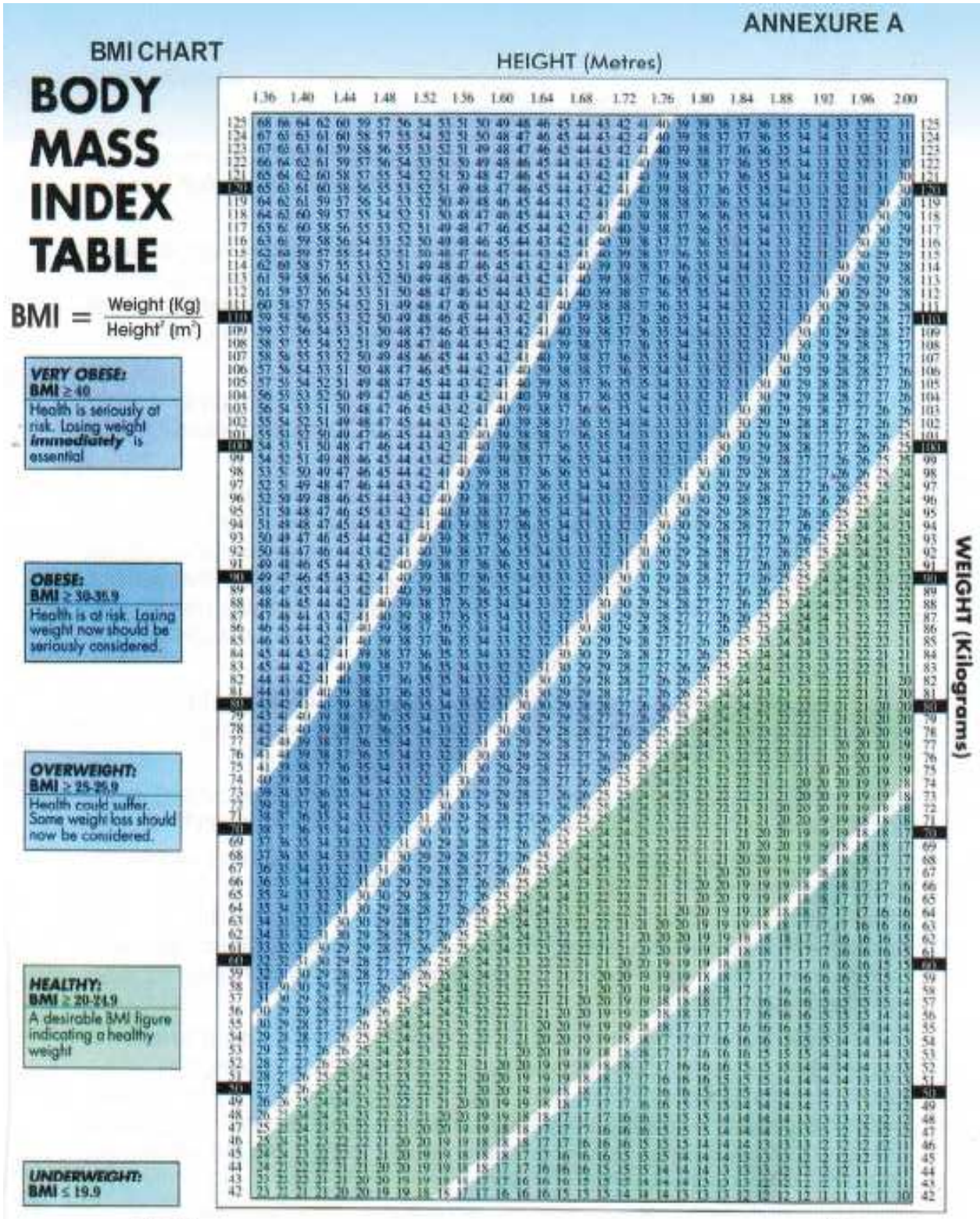
VERY OBESE:
BMI ≥ 40
Health is seriously at risk. Losing weight ***immediately*** is essential

OBESE:
BMI ≥ 30-39.9
Health is at risk. Losing weight now should be seriously considered.

OVERWEIGHT:
BMI ≥ 25-29.9
Health could suffer. Some weight loss should now be considered.

HEALTHY:
BMI ≥ 20-24.9
A desirable BMI figure indicating a healthy weight

UNDERWEIGHT:
BMI ≤ 19.9



Men: 94-102cm
Women: 80-88cm
→ **Waist circumference** ←
Men: ≥ 102cm
Women: ≥ 88cm

Alert zone
Increased risk of CVD

Danger zone
CVD risks tripled

ANNEXURE B

GENERIC BP MEASUREMENT PRINCIPLES.

These recommendations are generic and apply equally to all validated devices used for BP measurement, e.g. arm position, posture of the patient, cuff size and the number of readings that should be taken.

The elderly patient may present special problems with BP measurement, because there may be considerable BP variability with periods of hypertension as well as hypertension. This occurs particularly in hot weather. The most common form of hypertension in the elderly is isolated systolic hypertension, due to the stiffening of the large arteries that occurs with ageing.
It may be advisable to check the standing BP in hot weather particularly in diabetics, the elderly, those who have symptoms of postural hypertension (like dizziness), and in those who appear dehydrated.

1. BP is recorded using an approved device, with the patient in a sitting position for at least 5 minutes before measurement, with the back supported, feet on the floor and arm bared and resting on a surface at heart level. Patients should not have smoked ingested caffeine-containing beverages or had food in the previous 30 minutes. In persons over 60 years of age, those with diabetes mellitus and those at risk (see Table 2), The BP should also be recorded after standing for 1 minute to document postural hypertension.

2. An appropriate size cuff should be used: a standard cuff (12 cm) for a normal arm and a large cuff (15 cm) for an arm with mid-upper circumference >33cm (the bladder within the cuff should encircle 80% of the arm).
If an undersized cuff is used, the BP can be overestimated (undercuffing), and if the cuff and bladder are too large the BP can be underestimated (overcuffing).

3. Both systolic BP (SBP) and diastolic BP (DBP) should be recorded. 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 higher BP. The SBP should be first estimated by palpation to avoid missing the auscultory gap. SBP is measured at the first appearance of sound (phase I) and DBP is measured at the disappearance of the sound (phase V).

4. The BP that is recorded should be the average of two readings taken one minute apart. If the two readings differ by 5mm Hg, additional readings should be taken. The blood pressure should be ≥ 140/90 mmHg three times within 2 months before a person is diagnosed as hypertensive. All measurements should be preferably be taken at the same time of the day an in the same arm. Above the age of 50, SBP is more important than DBP.

5. The BP measurement device and its attachments (tubing, cuff, valve) should be serviced and calibrated at least every two years.

6. The health care provider should provide to the patient, verbally or in writing, the specific BP reading and the BP goal.

ANNEXURE C

THERAPEUTIC EDUCATION FOR PATIENTS

The major objective is to empower all patients to actively participate in the management of their non-communicable chronic diseases/conditions.

a) Provide information to the patients so that they can understand hypertension and its consequences if not treated adequately. Involve the patient and family or care-giver in the management.
b) Inform patients if the distinction between having a risk factor and having disease and the benefits of controlling risk factors.
c) Reinforce importance of lifestyle modification at each visit.
d) Inform patients of their BP reading at every visit and whether BP is controlled or what the target should be.
e) Emphasize the importance of adherence to the management protocol.
f) Patients must know the name, strength and dose of the drug(s) prescribed the frequency of doses and the necessity of regular ongoing use.
g) Inform patients on how to deal with side-effects.
h) Patients must be made aware of drug interactions and food/drug interactions.
i) Tell patients to take the morning dose on the day of each visit to the health service.
j) Ask patients to return drug containers; even if they are empty, at each visit.
k) Support groups for the patients are essential and need to be established at all facilities. The focus should be on self-care and self-monitoring, emotional needs, cultural differences, discrimination, change management and behavioral change.
l) Counsel patients with hypertension who may have excessive fear of strokes or other consequences of hypertension.
m) Educate patients to inform all health care providers they visit, that they do have hypertension and which drug they are taking.
n) Encourage patients to request a BP measurement at each visit.

ANNEXURE D

CAUSES OF RESISTANT HYPERTENSION

- Incorrect blood pressure measurements
- Volume overload
  - Excess sodium intake
  - Volume retention from kidney disease
  - Inadequate diuretic therapy
- Drug-induced or other causes
  - Non-adherence
  - Inadequate dose
  - Inappropriate combinations
  - Non-steroidal anti-inflammatory drugs e.g. ibuprofen
  - Cocaine, amphetamines, other illicit drugs
  - Sympathomimetic (decongestants, anorectics)
  - Oral contraceptives
  - Adrenal steroids
  - Cyclosporine
  - Liquorice
- Associated conditions
  - Obesity
  - Excess alcohol intake
- Identifiable causes of hypertension
  - Chronic kidney disease
  - Chronic steroid therapy
  - Coarctation of the aorta
  - Crushing syndromes
  - Drug-induced or drug-related
  - Pheochromocytoma
  - Primary aldosteronism
  - Renovascular disease
  - Sleep apnoea
  - Thyroid or parathyroid disease
- Prescribed behavior
  - Irresponsible prescribing
  - Paternalistic behavior
- Patient behavior/circumstances
  - Non-adherence
  - Uncooperative
  - Uninformed about disease/risks
  - Lack of trust in care provider
  - Irresponsible behavior
  - Lack of transport
  - Poverty
- Health system related factors
  - Unavailability of drugs
  - Long-term/chronic care models not implemented
  - Ineffective referral system

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