NATIONAL USER GUIDE

on the Prevention and Treatment of Hypertension in Adults at the PHC Level 2021

health

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REPUBLIC OF SOUTH AFRICA

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This user guide aligns with National Department of Health and World Health Organization policies and clinical protocols:

- Standard Treatment Guidelines and Essential Medicine List for South Africa, Primary Healthcare Level, 2020 Edition (39)
- Moodley J et al. Hypertensive disorders in pregnancy: 2019 National guideline. S Afr Med J 2019;109(3 Suppl 1): S3-S16 (49)
- NDOH ART Guidelines (53)
- WHO HEARTS Technical Package: Cardiovascular Disease (All available at https://www.who.int/cardiovascular_diseases/hearts/en/#)
- Global Recommendations on Physical activity for Health 2020 (27)
- Food-based Dietary Guidelines for South Africa 2013. S Afr J Clin Nutr 2013;26(3) (Supplement):S1-S164. www.sajcn.co.za (63)

FOREWORD

Hypertension is referred to as a “silent killer”. Most people with hypertension are unaware of their condition as in most cases, they experience no warning signs or symptoms hence they are not identified or treated. Hypertention is associated with a number of conditions, disability, and causes of death. These include: strokes; myocardial infarction; end-stage renal disease; congestive heart failure; peripheral vascular disease and blindness. According to Stats SA, in 2017, hypertensive disorders resulted in 19 900 deaths with a further 44 357 deaths associated with cerebrovascular diseases and other heart diseases. This means around 30% of all deaths in 2017 were associated with increased blood pressure.

Hypertension has no boundaries; it affects all our communities and more recently we observed persons with hypertention who were infected with Covid-19, experience serious illness and even death. We are now seeing younger people presenting with the condition which appears to be linked to excalating overweight and obesity among our youth. Of major concern is that many people in South Africa with elevated blood pressure do not know that they have high blood pressure and even when people are diagnosed and put on treatment, they are not controlled resulting in complications, disability and even death. It is critical that South Africans have access and opportunities to measure their blood pressure and take action when one’s blood pressure is elevated as this may save their lives and that of loved ones.

The National User Guide on the Prevention and Treatment of Hypertension in Adults at the PHC Level 2021 must ensure that Health Care Workers take blood pressure correctly, that patients receive appropriate and comprehensive management to maintain controlled hypertension and refer patients to levels and points of care, as required. If we do not prevent hypertension, identify those with the condition early, treat and control the condition as well as prevent or delay the onset of complications; hypertention will have significant impact on the health and development of the patient and their families as well as impose an unaffordable burden on the health system and the economy at large.

DR SS BUTHELEZI
DIRECTOR-GENERAL: HEALTH
DATE: 23-08-2021

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MS APR CELE
ACTING DEPUTY DIRECTOR-GENERAL: PHC
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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

ABBREVIATIONS

ACE:	Angiotensin-converting enzyme
AF:	Arterial fibrillation
APC:	Adult Primary Care
BOD:	Burden of Disease
BMI:	Body Mass Index
CAD:	Coronary Artery Disease
CHC:	Community Health Centres
CHW:	Community Health Workers
CVD:	Cardiovascular Disease
DBP:	Diastolic Blood Pressure
ECD:	Early Childhood Development
eGFR:	Estimated glomerular filtration rate
GRADE:	Grading, Recommendations, Assessment, Development & Evaluation of evidence
HAART:	Highly Active Antiretroviral Therapy
HEARTS:	Healthy-lifestyle counselling, Evidence-based protocols, Access to essential medicines and technology, Risk-based CVD management, Team-based care and Systems for monitoring
HIV:	Human Immunodeficiency Virus
Ht:	Hypertension
HCTZ:	Hydrochlorothiazide
HELLP syndrome:	Presence of haemolysis, elevated liver enzymes and low platelets
HMOD:	Hypertension mediated organ disease
HTN:	Hypertension
ICRM:	Ideal Clinic Realisation and Maintenance Program
MI:	Myocardial infarction
MRC:	Medical Research Council
NCD:	Non-Communicable Disease
NDOH:	National Department of Health
PAD:	Peripheral artery disease
PEN:	Package of Essential Non-communicable
PHC:	Primary Health Care
SBP:	Systolic Blood Pressure
STGs:	Standard Treatment Guidelines
TIA:	Transient Ischemic Attack
TOD:	Target organ disease
WBOTS:	Ward-based outreach teams
WHO:	World Health Organisation

SUMMARY OF KEY MESSAGES

Easy page find

Normal BP = 140/90 — 10

Above this measurement, is raised BP = Hypertension
Do:
- Risk assessment
- Clinical assessment

Who is at risk for Hypertension? — 13

Older people
Certain ethnic groups
Family history
Overweight/obesity
Lack of exercise
Tobacco use
Too much salt
Too little potassium
Excessive alcohol use
Stress
Certain chronic conditions
Pregnancy

Screening essentials — 17

All adults >18 years
Particularly those at risk

Correct measurement of blood pressure. — 25

Correct cuff size
Calibrated instrument
Patient comfortable and relaxed
First time measurement: 3 readings, 1 – 2 minutes apart, average of 2nd & 3rd reading

Basics of health promotion — 15

What is it?
How do you get it?
Symptoms to watch out for
What makes it worse?
What makes it better?

Co-morbidities — 44

Diabetes
Previous heart conditions
HIV
Pregnancy?

Summary algorithm of clinical management
Lifestyle modification
↓
Add hydrochlorothiazide
↓
Add CCB or ACE inhibitor
↓
Increase dose of CCB or ACE inhibitor
↓
Add a 3rd medication: CCB (if on ACE) or ACE inhibitor (if on CCB)
↓
Increase dose of 3rd medication
↓
Increase dose of hydrochlorothiazide + 4th antihypertensive
↓ — 31
Refer

Be mindful of: — 38

- Resistant hypertension
- Hypertensive emergency
- Hypertension - mediated organ damage (HMOD)

Summary of referral pathways — 9

Symptoms
Emergency
Community screening
↓
PHC facility
↙ ↘
Treated & Managed
Emergency Not stable
↓
District Hospital

Compliance and follow up: — 41

Good adherence means taking medication every day and keeping appointments

1. INTRODUCTION

Across the world, more than a billion people have hypertension (1), and it is a major cause of premature death and disability (2). It has been estimated by the World Health Organisation that 1 in 4 men and 1 in 5 women have hypertension (3).

The vision of the National Department of Health is "A Long and Healthy Life for All South Africans" (4). It is envisaged that this will be realised through the prevention of illness and diseases, the promotion of healthy lifestyles and consistently improving healthcare delivery which is essential to address the alarming increased prevalence of non-communicable diseases in the South African population.

Hypertension is called a "silent killer". Most people with hypertension are unaware of the problem because it may have no warning signs or symptoms and a significant amount of people are not treated. For this reason, it is essential that blood pressure is measured regularly (5) and public awareness be raised. In addition, a large proportion of people with hypertension do not have it under control.

This user guide aims to intentionally address the detection and management of hypertension in order to prevent and mitigate hypertension against the detrimental effects on each individual. It is intended for use by Primary Health Care professionals. It is a user guide to screen, detect and appropriately manage and monitor patients with hypertension. It also indicates when to refer patients out of primary care when necessary.

In essence, we aim for a seamless flow of patients through the system by both up referral and down referral to provide optimum management of hypertension.

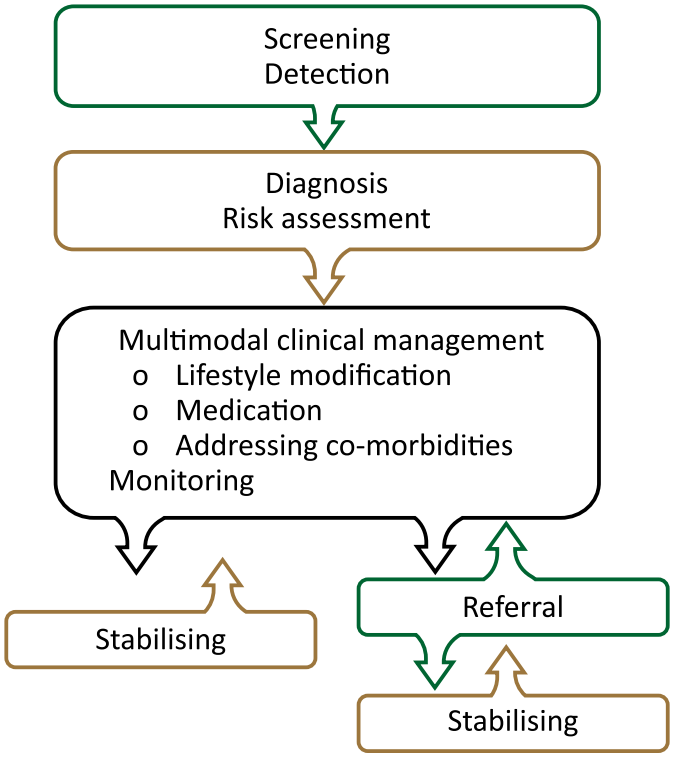


Fig 1: An overview of hypertension detection, diagnosis and management

2. SERVICE DELIVERY

- **SERVICE DELIVERY PLATFORM**

Health services are made available to all people who access the health care system across a continuum of care.

As a patient moves through the health system from one level to another and back home, there needs to be a co-ordinated, seamless transition of care with clear referral pathways and guidelines. The continuum of care is inclusive of health promotion, disease prevention, treatment, care and support, rehabilitation and palliative care underpinned by good environmental health within the context of the social determinants of health.

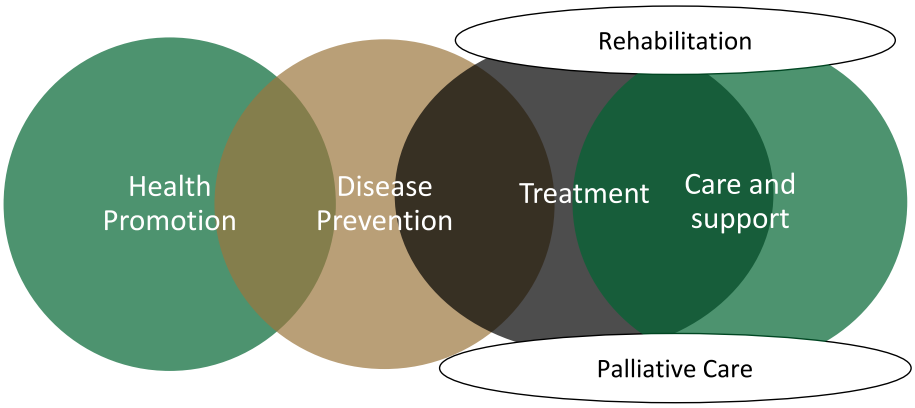


Fig 2: The continuum of health services

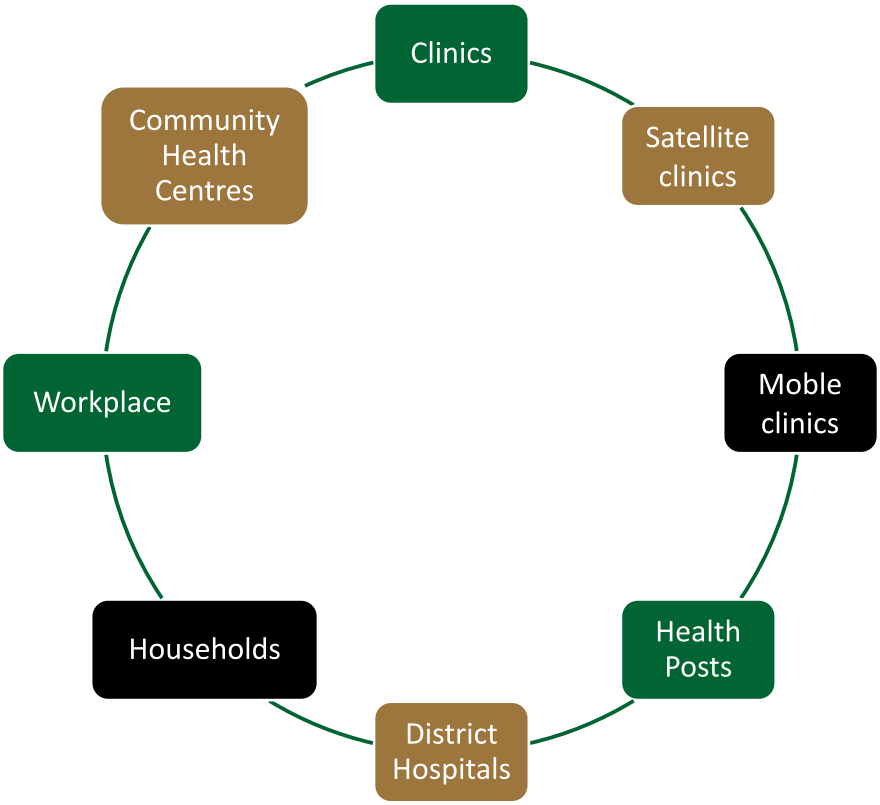


Fig 3: This continuum of care spans the platform of service delivery

• THE PRIMARY HEALTH CARE APPROACH

High-quality primary care services should be at the core of any health system (6). The majority of the management of hypertension takes place within Primary Health Care (PHC) which services the majority of a person's health needs throughout their lifetime. This includes physical, mental and social well-being and it is people-centred rather than disease-centred.

A primary health care approach includes three components:

- meeting people's health needs throughout their lives;
- addressing the broader determinants of health through multisectoral policy and action; and
- empowering individuals, families and communities to take charge of their own health (7).

In the South African health system, this takes place within the District Health System PHC re-engineering model as shown in Fig 4 (8). In addition, in order to take cognizance of the health system challenges, South Africa has embarked on the Ideal Clinic Realisation and Maintenance (ICRM) Program. An Ideal Clinic is defined as a clinic with good infrastructure, adequate staff, adequate medicine and supplies, good administrative processes, and sufficient adequate bulk supplies (9).

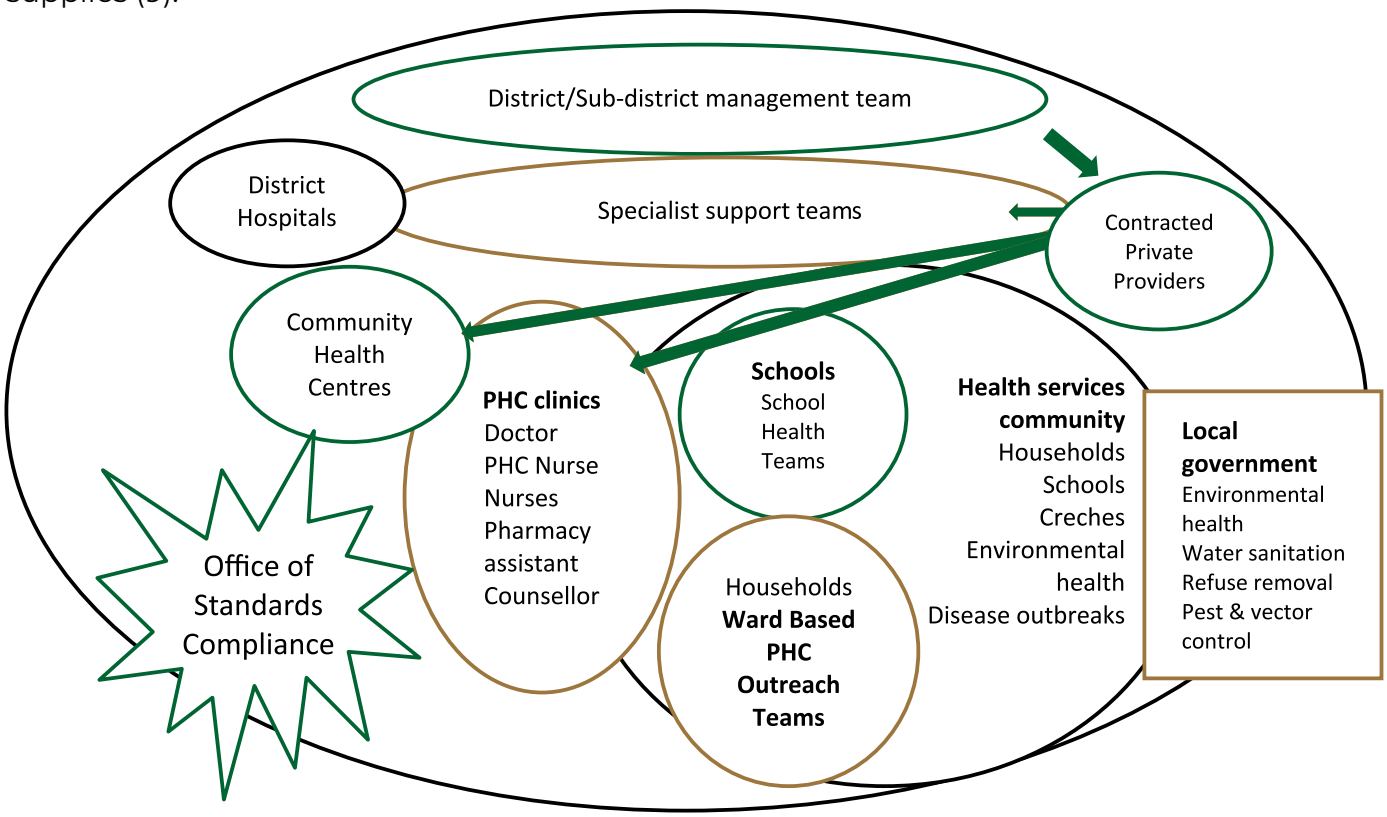


Fig 4: The district health services model of Primary Health care

• LEVELS OF CARE

The majority of patients with hypertension are identified in primary care facilities. The PHC clinics and community health centres (CHC) are the first formal institutional point of contact with the health services. Referral refers to the processes by which professionals and institutions communicate and work together to protect, promote and restore the health of an individual (10). This movement of a patient to another level of care could be internal, upward, downward or lateral for continuity of care.

Patients may present at the PHC/CHC with any healthcare requirement and will either receive the care they need at this level or will be referred to a hospital if more specialised services are necessary.

District hospitals are the highest level of support within the district health system and thus perform a gatekeeper role in supporting primary healthcare clinics on the one hand and being a gateway to more specialist care.

Down referral is a process in which healthcare providers at higher levels of care who, after managing the clinical condition of the referred patients, may refer the patient back to the original referring facility at a lower level of care or to the community-oriented services for continued management, rehabilitation or palliative care. Down referrals to the initiating health establishment or another appropriate level of health establishment may take place from a central, tertiary, regional or district hospital.

A well-functioning referral system that allows for continuity of care across different tiers of care is central to the delivery of efficient care (Fig 5). The referral system is not confined to formal health facilities but includes linkages to community-based services and other intersectoral services that address the social determinants of health.

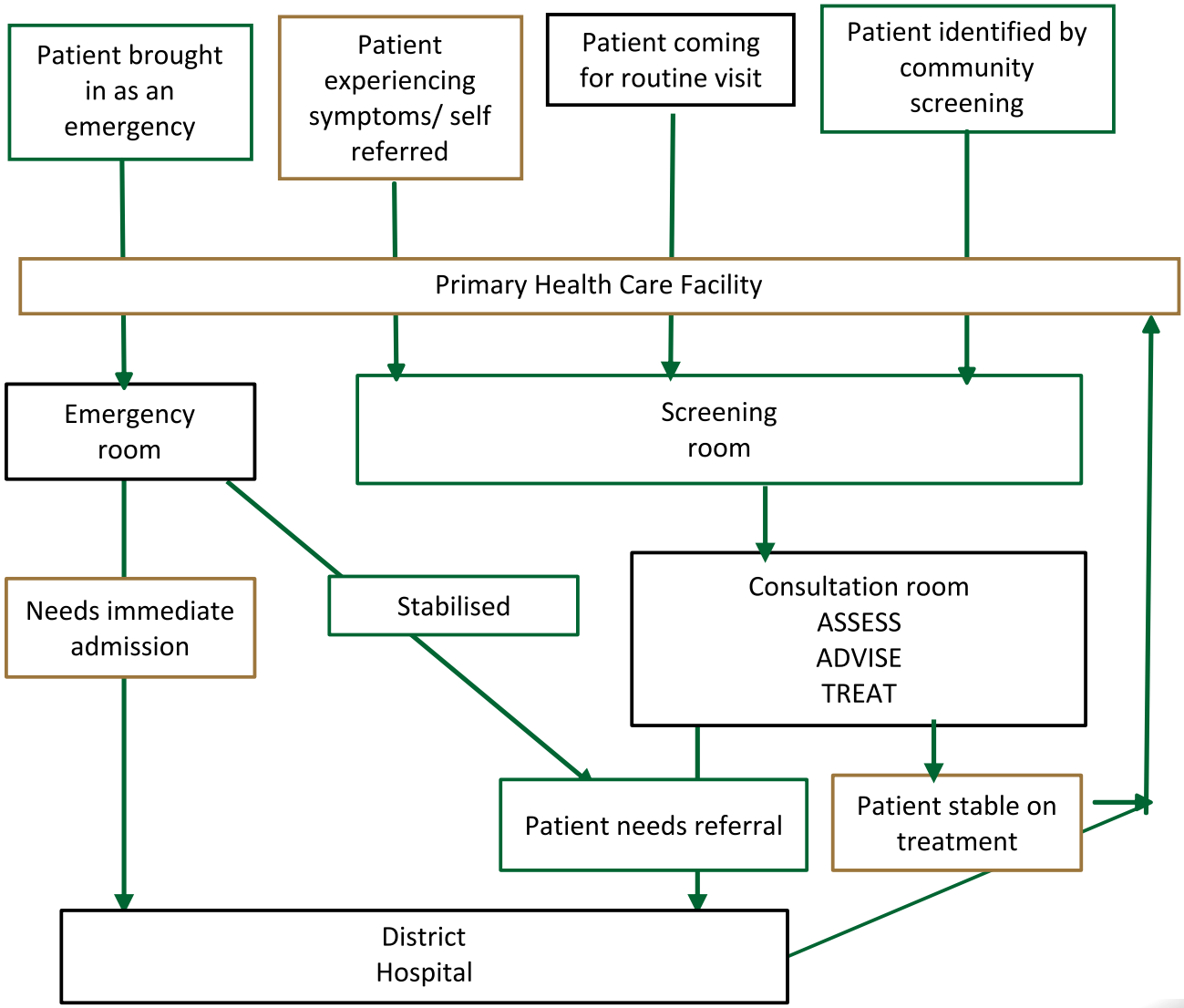


Fig 5: The patient's journey through the PHC service

3. DEFINITIONS AND CLASSIFICATION OF HYPERTENSION

- **DEFINITION**

Hypertension is defined as

- a systolic blood pressure [SBP] of 140 mmHg or more, or a diastolic blood pressure [DBP] of 90 mmHg or more.

Hypertension = BP ≥ 140/90 (3, 11, 12, 13, 14)

This must be measured on 3 separate occasions, a minimum of 3 BP readings at a minimum of 2 minutes apart must be taken at the 1st visit (13, 14), to confirm hypertension, except for severe hypertension (Table 1).

- **CLASSIFICATION**

*BP category**	*Systolic BP mm Hg*		*Diastolic BP mm Hg*
Normal	< 120	and	< 80
Optimal	120 - 129	and	< 80
High normal	130 - 139	or	80 - 89
Hypertension			
Mild (Grade 1)	140 - 159	or	90 - 99
Moderate (Grade 2)	160 - 179	or	100 - 109
Severe (Grade 3)	≥ 180	or	≥ 110
Isolated systolic	≥ 140	and	< 90
*Individuals with SBP and DBP in two categories should be designated to higher BP based on two or more careful readings obtained on 2 or more occasions.			

Table 1: Classification of blood pressure

- **RELATED TERMINOLOGY**

White coat Hypertension: This refers to patients whose blood pressure is higher by 10% in a health facility (± 10%) than other places, such as home. It's called white coat hypertension because the health care professionals who measure the blood pressure sometimes wear white coats/uniforms.

Masked Hypertension: patients who have non-elevated BP in the office but elevated BP out of the office (ambulatory or home) (10 – 15%).

Patients with either of these types of Hypertension are at risk (14).

The relationship between hypertension and other cardiovascular conditions is continuous. Hypertension as a condition associated with conditions of lifestyle, and is also closely related to the co-morbidities of Diabetes and consequent renal conditions. Therefore, while cut-off BP values are used for pragmatic reasons to simplify the diagnosis and decisions about treatment, the issues of co-morbidities and risk factors must be borne in mind (15).

4. EPIDEMIOLOGY

- **PREVALENCE AND POPULATION DISTRIBUTION**

Burden of Hypertension: Global

Hypertension is a major cause of premature death worldwide (3).
An estimated 1.13 billion people worldwide have hypertension, most (two-thirds) of them living in low- and middle-income countries.
In 2015, 1 in 4 men and 1 in 5 women had hypertension.
Fewer than 1 in 10 people with hypertension have the problem under control (16).

Burden of Hypertension: South African context

South Africa has a fourfold burden of disease. This is comprised of (i) communicable diseases such as HIV/AIDS and TB (ii) maternal and child mortality (iii) NCDs such as hypertension and cardiovascular diseases, diabetes, cancer, mental illnesses and chronic lung diseases like asthma, and (iv) injury and trauma. (17).

According to Statistics SA (18), the main groups of causes of death include diseases of the circulatory system (18,4%), certain infectious and parasitic diseases (17,6%) and endocrine, nutritional and metabolic diseases (7,0%). Trends over the past few years show that non-communicable diseases are on the rise.

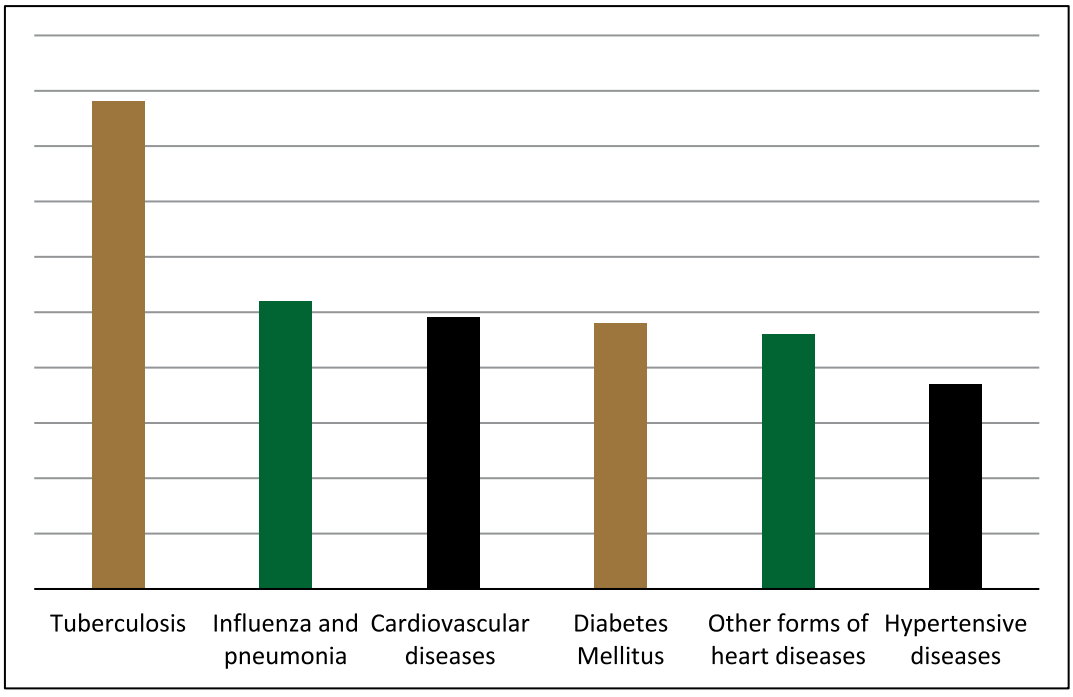


Fig 6: Statistics SA: some main causes of death in South Africa

WHO (19) states that the non-communicable diseases (not including cancer) make up over a third of main causes of death in South Africa.

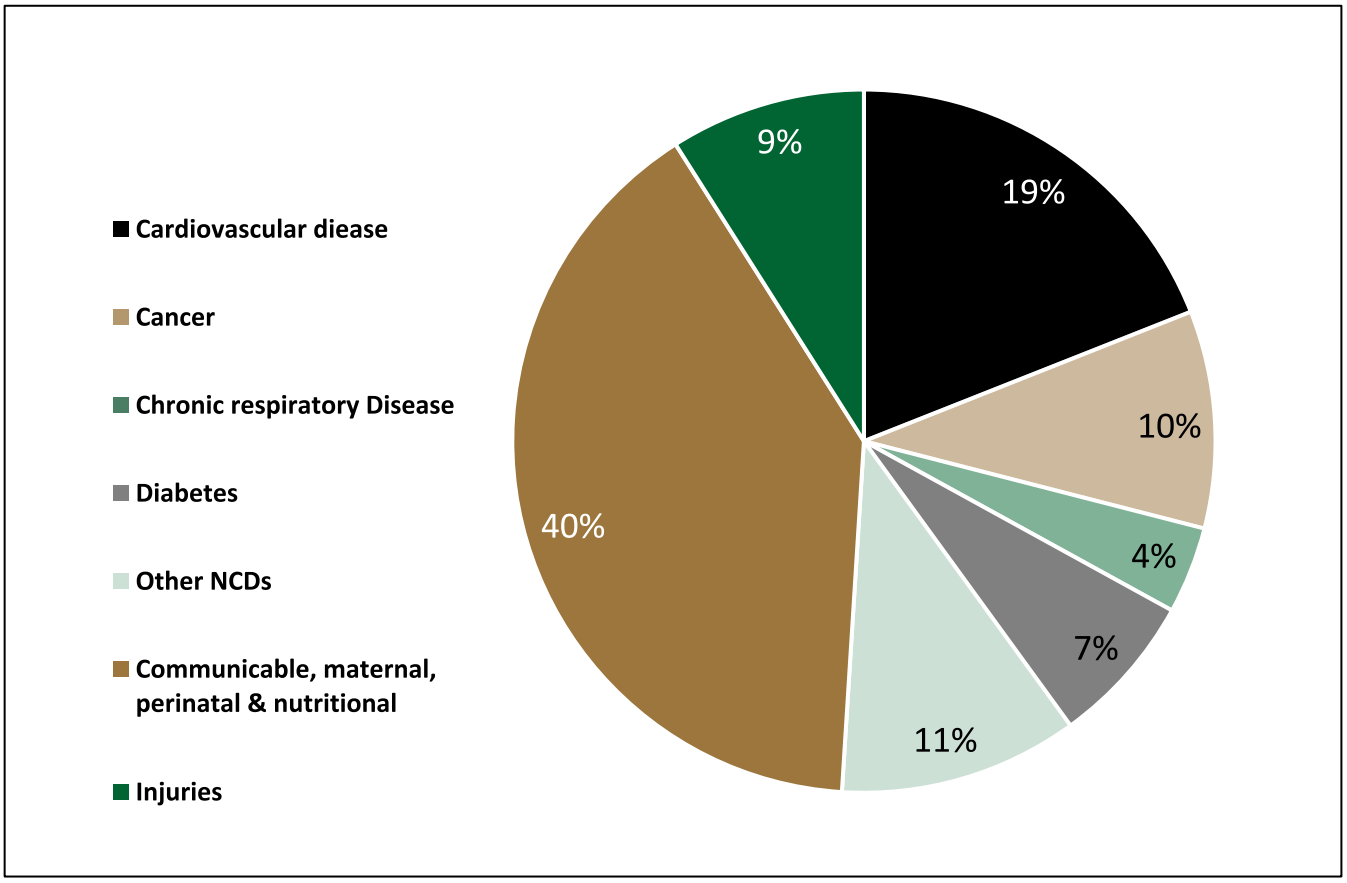


Fig 7: Causes of mortality in South Africa according to the WHO

There is a rising tide of NCDs that are affecting the quality of life and increasing health-care expenses (20). The significant increase in hypertension in the past 10 years, as well as the inadequate diagnosis and control of raised blood pressure means that there will be more strokes and heart attacks in the years to come. Predisposing factors such as salt intake and obesity must be addressed to reduce BP in the future (3).

- **RELATED MEDICAL CONDITIONS / EXISTING CO-MORBIDITIES**

According to the World Health Organisation (WHO), the four main types of non-communicable diseases are cardiovascular diseases (like heart attacks and stroke), cancer, chronic respiratory diseases (such as chronic obstructed pulmonary disease and asthma) and Diabetes,

The four major NCDs share common risk factors: tobacco use, physical inactivity, harmful use of alcohol and an unhealthy diet (21, 22).

When diagnosing and managing hypertension in individuals, it is essential that the patient's total profile is kept in mind, including the co-morbidities and related risk factors.

5. RISK FACTORS FOR HYPERTENSION

People with any of the following are at risk for hypertension (23, 24):

- **Age.** The risk of high blood pressure increases with age.
- **Ethnic group.** High blood pressure is particularly common among people of African heritage
- **Family history.** High blood pressure tends to run in families.
- **Being overweight or obese.**
- **Sedentary lifestyle.** People who are inactive tend to have higher heart rates.
- **Using tobacco of any kind.** This can cause the arteries to narrow and increase the risk of heart disease. Second-hand smoke also can increase the heart disease risk.
- **Too much salt (sodium) in the diet.**
- **Too little potassium in the diet.** Potassium helps balance the amount of sodium in the cells.
- **Excessive alcohol intake.**
- **Stress.** High levels of stress can lead to a temporary increase in blood pressure.
- **Certain chronic conditions.** Certain chronic conditions also may increase risk of high blood pressure, including kidney disease, diabetes and sleep apnoea.
- Sometimes high blood pressure may occur during **pregnancy.**

GROUPING RISKS:

Inherent risks	Lifestyle risks	Other conditions	External factors
• Age • Ethnic group • Family history	• Sedentary lifestyle • Using tobacco of any kind • Excessive alcohol intake • Too much salt in the diet. • Too little potassium in the diet.	• Obesity • Certain chronic conditions • Pregnancy	• Stress

The risks for hypertension must be seen within the context of the multiple risk factors for cardiovascular disease. There are physiological factors such as age, high cholesterol or blood glucose as well as behavioural risks such as smoking or lack of physical activity.

These risks are also linked to underlying social factors and circumstances that contribute to the larger risk picture (25). For example, income may contribute to unhealthy eating where an individual can only afford highly processed, energy-dense, micronutrient-poor foods that leads to obesity, or urbanization introduces an individual to unhealthy habits such as smoking/ tobacco use or excessive use of alcohol.

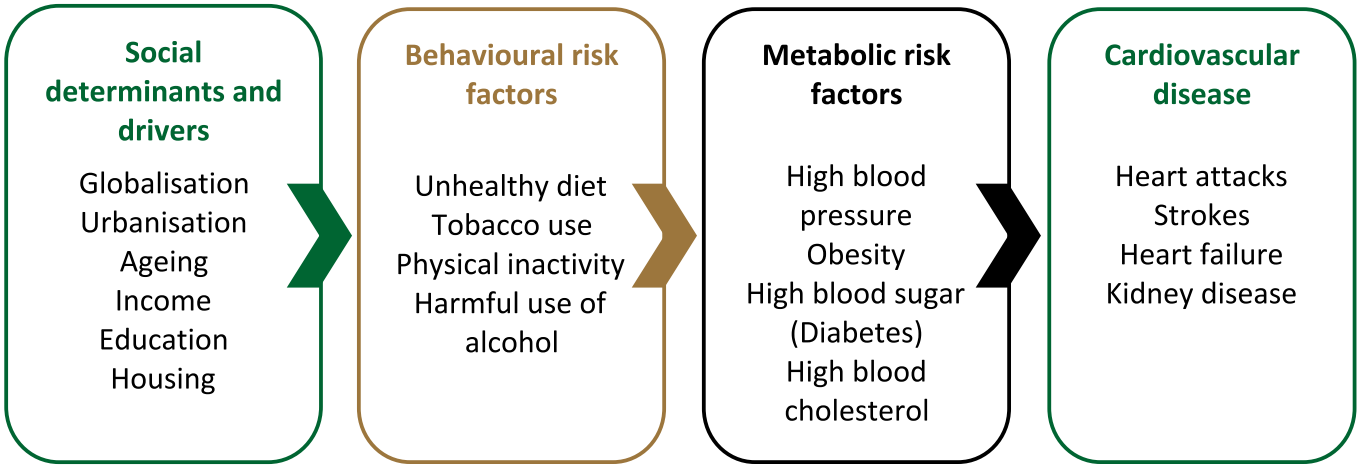


Fig 8: Factors contributing to the development of cardiovascular disease and related complications

(Source: WHO HEARTS Technical package for cardiovascular disease management in primary health care 2016)

- **CO-MORBIDITIES AND DISEASES OF LIFESTYLE**

A comorbidity is the presence of one or more additional medical conditions often co-occurring or co-existing with a primary condition e.g., hypertension and Diabetes or Diabetes and heart disease (26). Some comorbid conditions and or lifestyle behaviours increase the likelihood of an individual having hypertension,

Programmes in primary care may be geared to focus on single risk factors such as hypertension. Although this approach seems simple, it can neglect to treat those with concurrent conditions, and who have an overall higher cardiovascular risk. In addition, the single risk factor approach does not take into account the continuous relationship between blood pressure, blood glucose, blood cholesterol and cardiovascular risk (17).

In the case of a patient with hypertension, the most common conditions that may also be present include:

- Obesity
- High fats/cholesterol
- Diabetes

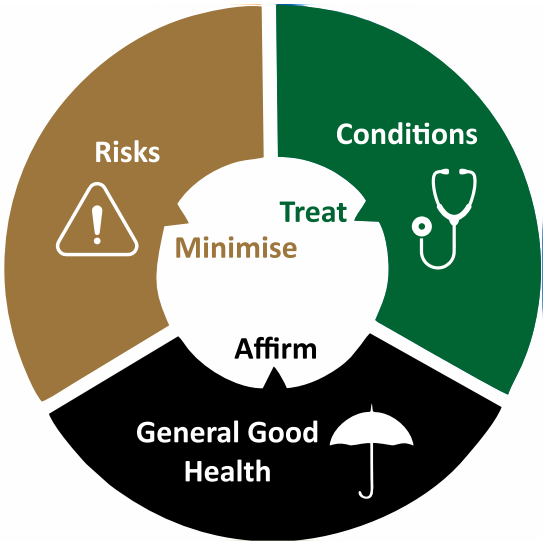
These are directly related to risks of an unhealthy lifestyle including lack of physical activity, eating patterns, tobacco use and harmful use of alcohol.

These 'diseases of lifestyle' are driving the alarming rise in NCD in populations all over the world. It is therefore so important that we do not simply treat these NCDs (mainly Hypertension and heart disease, Diabetes) but that there is a drive to raise awareness of the destructive nature of unhealthy lifestyle and that the approach to healthy lifestyle becomes an integral part of the overall management of hypertension. The PHC team are best placed to implement this approach.

6. HEALTH PROMOTION

• PRINCIPLES OF HEALTH PROMOTION

Health promotion is the process of enabling people to increase control over their health and its determinants, and thereby improve their health (27).
The aim is to help individuals and communities improve their health, by increasing their knowledge or influencing their attitudes and stimulating action.



People present at a health facility with conditions that the health care provider needs to treat.
It is also important to affirm a patient's good health and make them aware of the risks to their health.

Fig 9: Affirm good health, minimise risk, treat conditions (28)

• HEALTH PROMOTION APPROACH

In a one on one in patient consultation, health promotion is integral to a holistic patient approach, and not just to be added on at the end of the consultation.

'Diseases of Lifestyle', namely non-communicable diseases, are on the increase. Therefore, it is important to see the clinical management of hypertension as more than just a condition to be controlled by medication, but as a multimodal management that will prevent complications and avoid simply increasing medication to stabilize blood pressure. For example, when healthy physical activity is introduced into the treatment plan, there is evidence that this can significantly contribute towards lowering blood pressure (29).

A basic risk assessment, as shown in section 8 (page 24) helps to identify areas of risk in the lifestyle of the individual, and to raise the patient's awareness of his/her risks. This enables an individual to take responsibility for his/her own health.

• HEALTH PROMOTION BY COMMUNITY HEALTH WORKERS

'Health for All' has been developed as a tool that aids the efforts of CHWs who are working in their designated areas of practice (30). This is aimed to assist the CHW to communicate basic health messages effectively with individuals, families and other groups of people in the community.

This tool takes a life cycle approach from pregnancy and infancy through to old age and helps to identify 9 main risk factors that threaten good health or worsen existing conditions, while it also addresses 13 existing chronic conditions. The information in this tool is crafted for the benefit of people in the community and is framed in a way that this information can be easily understood. The messages should be used by the CHW to encourage patients towards self-management of their health or existing conditions.

- **OTHER PLATFORMS OF HEALTH PROMOTION**

In addition to community workers, all members of the primary healthcare team should be well-versed in health promotion as well as lifestyle interventions to address prevention of disease development. This is an opportunity the first point of contact.

This includes nurses, medical doctors, pharmacists, school nurses, occupational health professionals

- **GROUP HEALTH PROMOTION**

This may take place at various venues and events as opportunities arise.

- *The health facility waiting room*. This is an ideal place to use the waiting time of patients as an opportunity to raise their awareness of conditions that threaten their health. This is sometimes done by a member of the health professional team, or a community health worker.

  Posters in the waiting room that address basic facts about health conditions also serve to inform and raise awareness of patients about specific conditions, e.g., HIV/AIDS, Diabetes, Hypertension.

- *Schools*. Children start in their early years to develop unhelpful habits such as too much sitting time, unhealthy snacks and consuming foods and drinks containing too much sugar, salt and fat. The Integrated School Health Programme aims to increase knowledge and awareness of health-promoting behaviours and increase knowledge and awareness of health (31). There are NGOs who conduct health promoting programs in schools as events or as an ongoing input into the school curriculum. Healthy lifestyle habits are routinely included in the Life Orientation stream of the school curriculum.

- *Community screening drives and events*.
  Screening drives can be scheduled in a certain community at an accessible venue such as a shopping mall, and serve 2 purposes.

  These drives may raise the awareness of people about life threatening conditions and secondly, they can also offer simple screening to voluntary people to identify these conditions, e.g., HIV rapid testing, fingerpick glucose, blood pressure measurement and Body Mass Index (BMI).

  Those identified to be at risk are then referred to the local health facility for follow up.

7. COMMUNITY SCREENING

Screening is the first step in a stepwise approach to supporting linkage to care, retention in care and adherence to treatment for hypertension (32).

Screening for hypertension is an essential part of routine community screening for chronic diseases.

This identifies people at risk as well as raises awareness of the population of the prevalence of hypertension.

- **WHO TO SCREEN?**

Special attention should be given to individuals who are at risk, see risk factors, section 5.

- **HOW TO SCREEN?**

Blood pressure must be measured according to the method described in the section 8: BP measurement procedure (page 24).

- **WHEN TO SCREEN?**

At health facilities

All adults ≥ 18 years who attend a PHC facility (33) at routine visits including all adults at first presentation (21) must be screened by routine blood pressure measurement for hypertension. This is part of the initial screening room procedure, processing each individual, or as part of the consultation with the primary health care provider.

Community drives/events/roadshows

While this method may identify people in a community who are unaware that they have hypertension, there is no evidence that this type of screening affects the outcomes of hypertension (34). However, it may provide health education and raise awareness of NCDs including hypertension.

By Community Health Workers (10)

The Ward Based Outreach Teams (WBOTS) may be equipped to measure blood pressure on their routine household visits. This screening by WBOTS helps to relieve the burden to PHC facilities.

Screening for hypertension serves to set off a chain of events that will prevent, treat and mitigate the sequelae of hypertension in the individual.

For healthy people with an optimal office BP [<120/80] BP should be measured at least every 5 years and more frequently when opportunities arise.

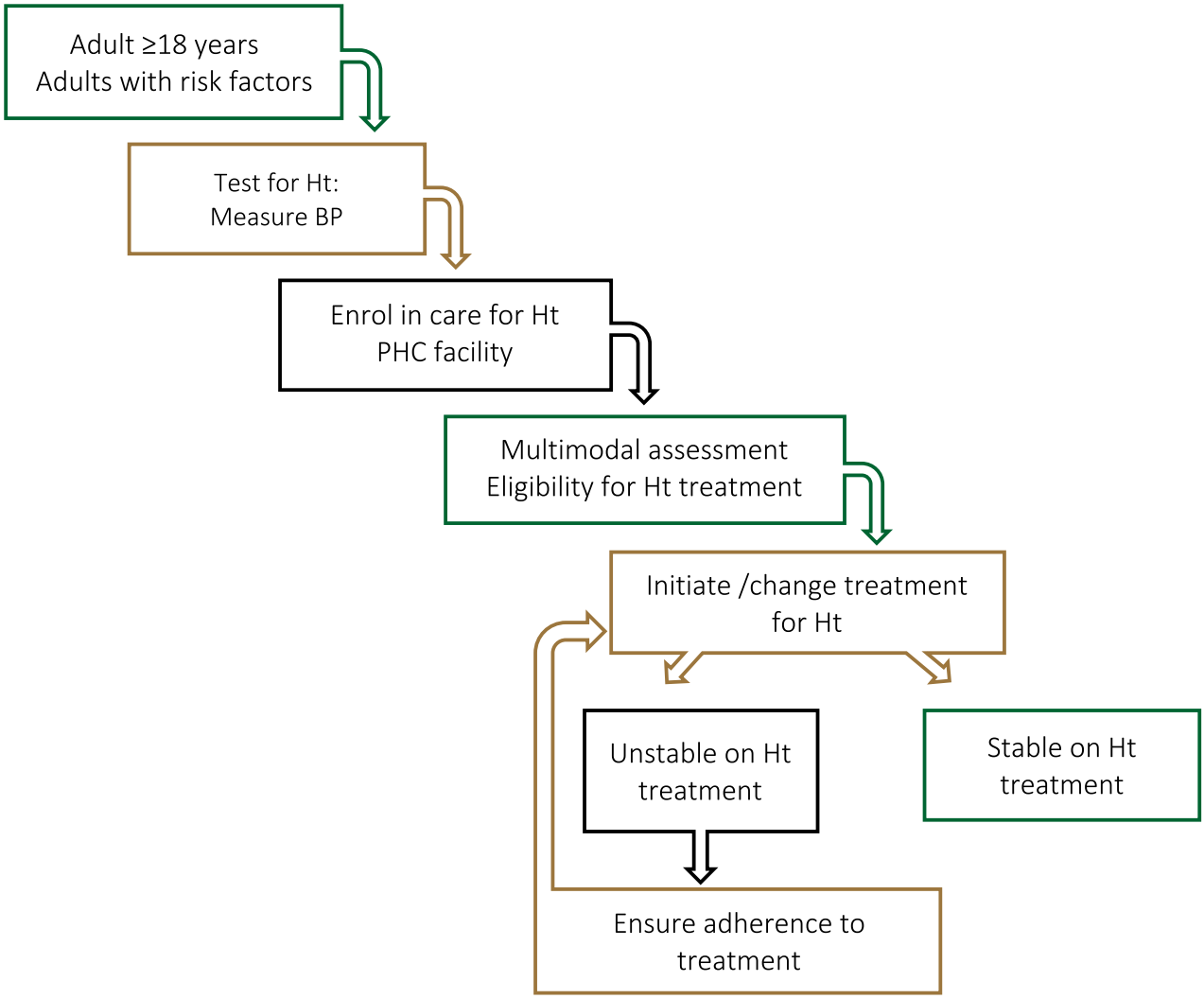


Fig 10: The flow of screening

8. DIAGNOSIS OF HYPERTENSION

- **PATIENT-CENTERED APPROACH**

It is vital that the patient takes ownership of his/her condition.

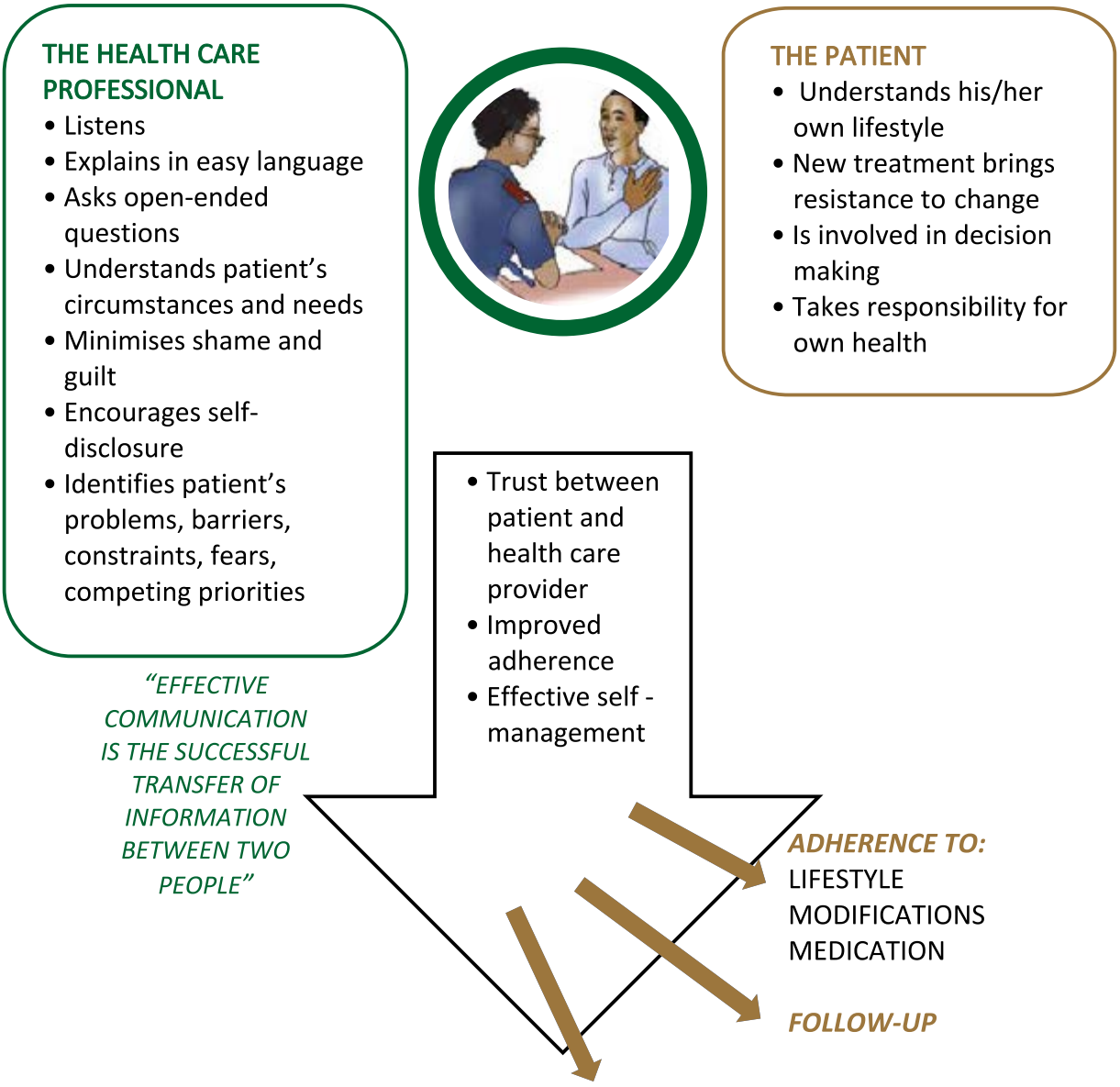


Fig 11: A patient-centred approach

Part of the successful management of conditions is that the health care professional sees the patient as a whole entity, and not just representative of disease.

All the factors that contribute towards the development of a condition must be considered in order to mitigate their effect.

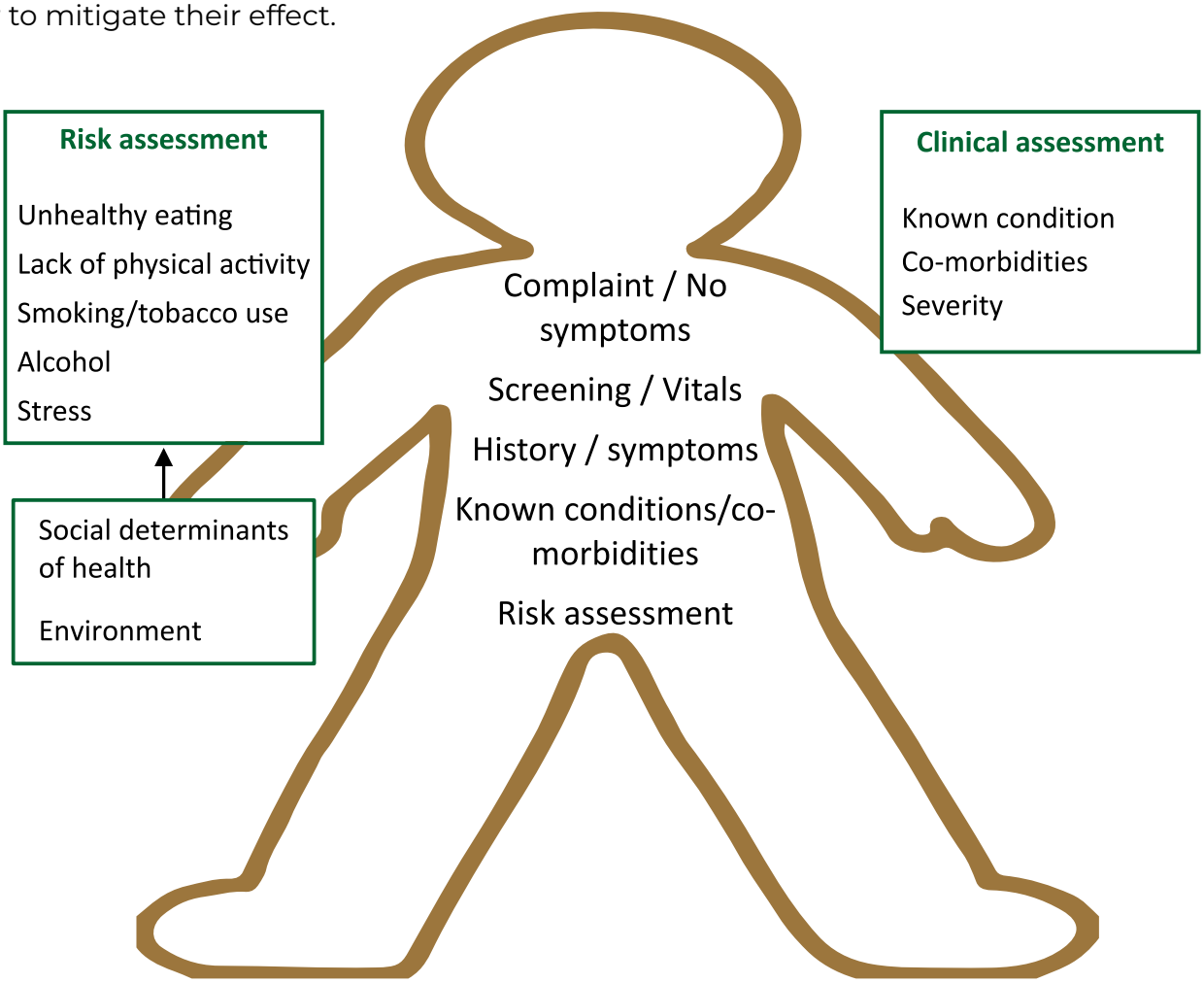


Fig 12: Patient assessment

- **PRESENTATION**

The majority of people with hypertension are unaware of the fact that they have raised blood pressure. This may be picked up on routine screening at a facility, or when a patient comes in with an unrelated complaint.

When symptoms do occur, they can include:
Headaches
Nosebleeds
Irregular heart rhythms
Vision changes
Buzzing in the ears
Dizziness
Shortness of breath

Severe hypertension can cause:
Fatigue
Nausea
Vomiting
Confusion
Anxiety
Chest pain
Muscle tremors.

• INITIAL SCREENING

All patients presenting at a health care facility are required to go to the screening room, unless it is an emergency condition.

This is where the following must be done:

- Height
- Weight
- Body Mass Index (BMI)
- Waist circumference
- Blood pressure
- Urine dipstix

• HISTORY TAKING

Taking a history is important to get a full picture of the patient (35). This history includes symptoms, previous illness or conditions and the presence of risk factors.

Ask about:

- Chest pain
- Breathlessness on exertion and/or lying flat
- Numbness or weakness of limbs,
- Loss of weight
- Increased thirst
- Polyuria
- Puffiness of face or swelling of the feet
- Passing blood in urine

- Whether they have been diagnosed with heart disease, stroke, Transient Ischemic Attack (TIA), diabetes mellitus, kidney disease
- Medicines that the patient is taking

- Is there a family history of heart attack or stroke?
- Current tobacco uses or vaping (yes/no) (If the answer is yes, if tobacco, etc use during the last 12 months)

• KNOWN CONDITIONS/CO-MORBIDITIES

It is important to establish whether the patient has been diagnosed with any other conditions.

Those that must be established are:

- Pregnancy
- Diabetes
- Previous heart conditions

- **RISK ASSESSMENT (36)**

Hypertension is a chronic non-communicable disease (NCD). It is strongly associated with lifestyle and there are known risks that co-occur and may give rise to the development of one or more of the NCDs.

The most important factors to consider when diagnosing and treating hypertension are:

- Age and gender (men > 55 years of age, women > 65 years of age)
- Family history of hypertension/CVD
- BMI > 25 (see below); Weight (waist circumference >94 cm (men) and >80 cm (women));
- Level of physical activity
- Use of tobacco/smoking
- Excessive use of alcohol
- Stress
- Blood lipids/cholesterol levels (normal cholesterol < 5/5.2 mmol/L
- Blood glucose level (normal random < 7.0 mmol/L

It should also be remembered that hypertension may occur in pregnancy without the presence of these risk factors stated above.

$$BMI = \frac{\text{Weight (kg)}}{[\text{Height (m)}]^2}$$

Body Mass Index /BMI		Waist circumference	
Overweight	Obesity	Women	Men
≥ 25	≥ 30	≥ 80 cm	≥ 94 cm

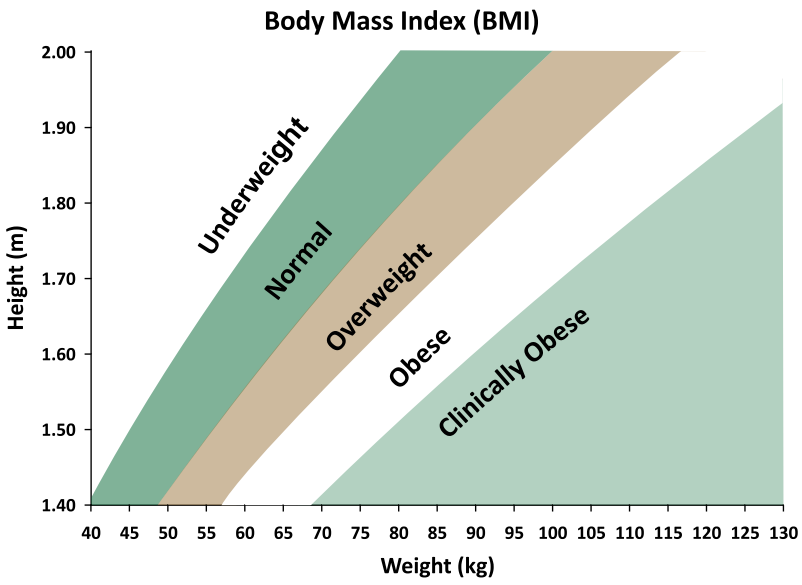


Fig 13: BMI calculation table

WHO IS AT RISK FOR HYPERTENSION?

Risk based assessment

This simple risk-based assessment will help to identify areas of risk for the individual and inform the lifestyle modifications needed. The age of onset of Hypertension is getting lower every year.

Framingham cholesterol-based risk score (37)

1. Age (years)	Man	Woman
30-34	0	
35-39	2	2
40-44	5	4
45-49	6	5
50-54	8	7
55-59	10	8
60-64	11	9
65-69	12	10
70-74	14	11
75-79	15	12

2. Total cholesterol (mmol/L)	Man	Woman
<4.1	0	0
4.1-5.19	1	1
5.2-6.19	2	3
6.2-7.2	3	4
>7.2	4	5

3. HDL cholesterol (mmol/L)	Man	Woman
>1.5	-2	-2
1.3-1.49	-1	-1
1.2-1.29	0	0
0.9-1.19	1	1
<0.9	2	2

4. On-treatment Systolic BP (mm Hg)	Man		Women	
	Not on BP treatment	On BP treatment	Not on BP treatment	On BP treatment
<120	-2	0	-3	-1
120-129	0	2	0	2
130-139	1	3	1	3
140-149	2	4	2	5
150-159	2	4	4	6
≥160	3	5	5	7

Other factors	Man	Woman
5. Smoker	4	3
6. Diabetes	3	4

BMI

The ideal weight should be maintained at ≥ 25 kg/m^2

Goal: Weight reduction to achieve BMI > 25 kg/m^2

Calculate score	
1. Sex & Age	
2. Total cholesterol	
3. HDL cholesterol	
4. On-treatment Systolic BP	
5. Smoker	
6. Diabetes	
Total CVD risk score	

- If the CVD risk score is ≥ 10%, then manage the CVD risk.
- If the CVD risk score is < 10%, and no CVD risk factors, then reassess the CVD risk after 5 years.

CVD risk score (man)	CVD risk score (woman)		CVD risk	Explain to patient
< 11	< 13		< 10%	There is less than 1 in 10 chance that in the next 10 years, that he/she may have a heart attack
11 - 14	13 - 17		10-20%	There is a 1 in 10 – 1 in 5 chance that in the next 10 years, that he/she may have a heart attack
≥ 15	≥ 18		> 20%	There is more than 1 in 5 chance that in the next 10 years, that he/she may have a Myocardial infarction (heart attack)

General CVD Risk Prediction			
Risk Factor	**Units**	**(Type of Placeholder Values in Each Cell)**	**Notes**
Sex	male (m) or female (f)	f	
Age	years	30	
Systolic Blood Pressure	mmHg	120,0	
Treatment for Hypertension	yes (y) or no (n)	n	
Smoking	yes (y) or no (n)	n	
Diabetes	yes (y) or no (n)	n	
Body Mass Index	kg/m²	27	
Your 10-Year Risk (The risk score shown is derived on the basis of an equation. Other print products, use a point-based system to calculate a risk score that approximates the equation-based one.)		1,1%	*If value is < the minimum for the field, enter the minimum value. If value is > the maximum for the field, enter the maximum value.*

Fig 14: Cholesterol-based CVD risk calculation

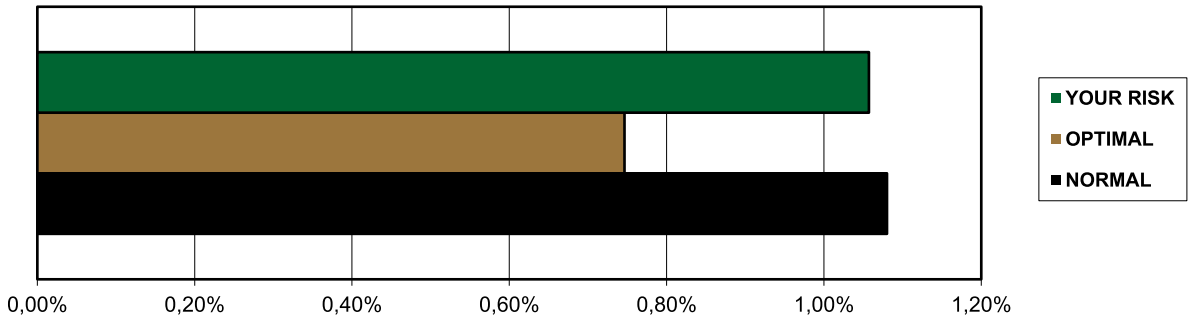


Fig 15: BMI-based CVD risk calculation

Measures to lower the risk score

- Lower BMI by weight reduction (healthy eating, increased physical activity). Maintain BMI = 25
- Reduce alcohol intake (Men: ≤ 2 drinks/day. Women ≤ 1 drink/day. 5 days a week)
- Regular moderate aerobic exercise (150 minutes/week; spread out over 5 days or 1 week)
- No smoking/tobacco

CVD risk tools are available on:

- The EML Clinical Guide mobile application
  or
- at: https://www.framinghamheartstudy.org/fhs-riskfunctions/cardiovascular-disease-10-year-risk/#

• PHYSICAL EXAMINATION

Blood pressure measurement and control is particularly important in adults who are at risk. The only way to detect hypertension is to have a health professional measure blood pressure.

BP MEASUREMENT PROCEDURE

A correct blood pressure [BP] measurement is key to the correct diagnosis of hypertension. Technical errors can happen often and can lead to inaccurate readings of the patients true BP. (15, 38, 39, 40)

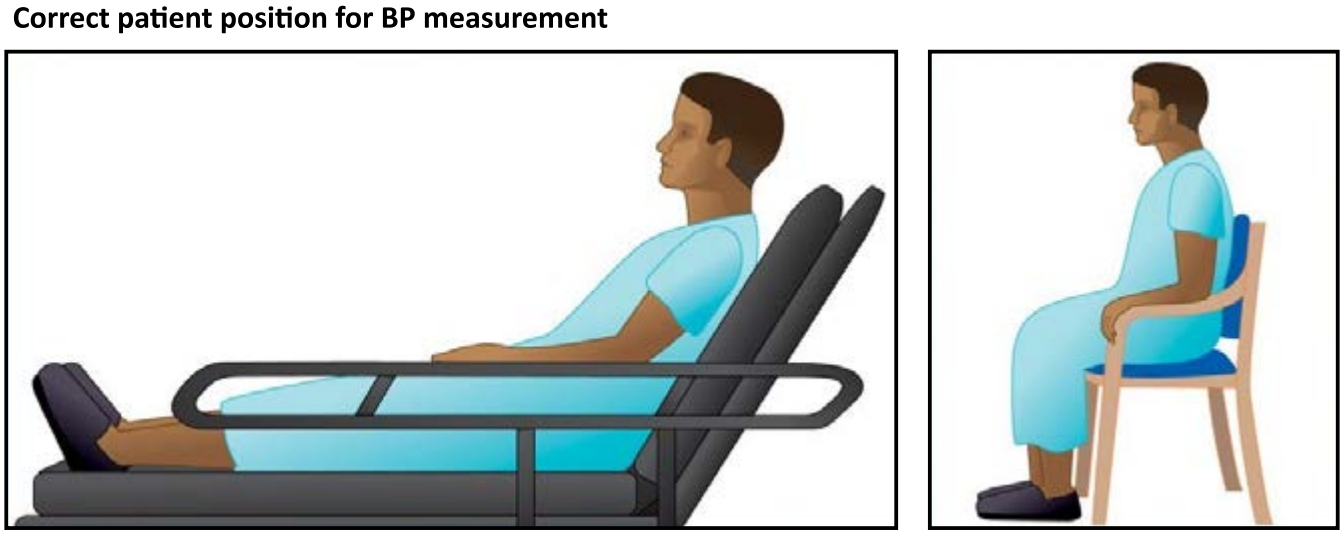


Fig 16: Correct patent positions for BP measurement

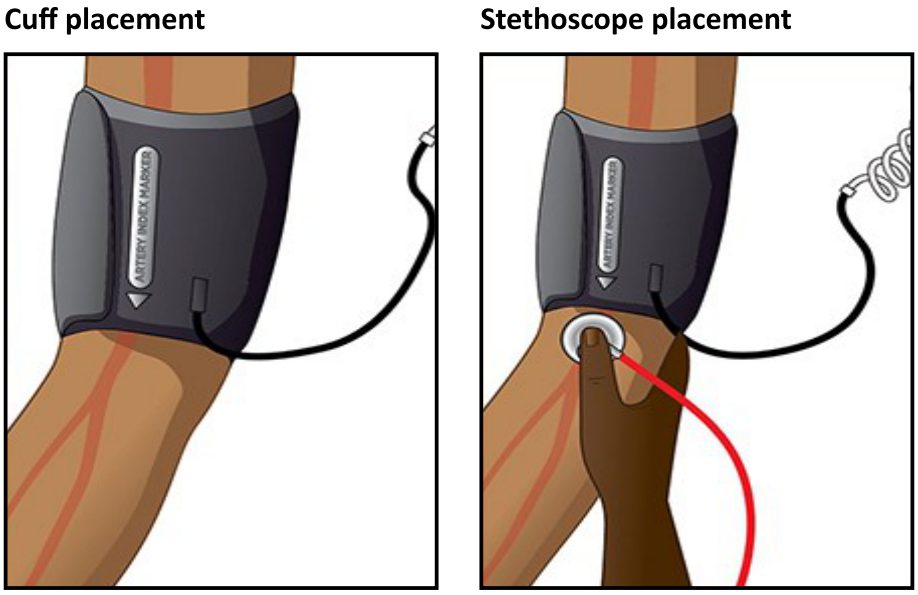


Fig 17: Placing the BP cuff

Align the arterial index marker with the brachial marker.

For manual, place the stethoscope diaphragm over the brachial artery.

Manual (with stethescope)

Inflate the cuff to 30mmHg above the estimated systolic level.
Slowly deflate the cuff at a rate of 2-3mm/second, noting when the sounds appear (systolic) and disappear (diastolic) to the nearest 2mmHg.

Automated

Check the equipment, ensuring it is in good working order and that it has been serviced and calibrated.
Switch on the automated BP device and press start to record the BP.
The World Health Organisation recommends the use of affordable, accredited and reliable electronic devices that have the option to select manual recordings (40).

Fig 18: BP measuring instruments in current use

PREPARATION? Sanitise your hands.
Remove any tight clothing that is restricting the arm.

↓

CUFF? Use the appropriate cuff size. The cuff must fit the arm size. The inflatable bladder should encircle at least 80% of the arm, but no more than 100% of it.
A standard bladder cuff =12-13 cm wide x 35 cm long.
If the arm circumference is >32 cm, use the large cuff.
Note the lines on the cuff to make sure that it is positioned correctly on the arm.

↓

INSTRUMENT? Blood pressure can be measured either by a conventional sphygmomanometer, using a stethoscope, or by an automated electronic device (see above). The electronic device, if available, is preferred because it provides more accurate results.

↓

POSITION? Quiet room and no talking while blood pressure is taken.
Patient in a comfortable position *(see Fig 16)*:
• lying, legs out stretched and uncrossed).
or
• sitting (back rest, feet on the floor, legs uncrossed).

↓

WHICH ARM? At the initial evaluation it is preferable to measure blood pressure in both arms and use the arm with the higher reading. At subsequent visits, this may not be practical in a busy primary care environment.

↓

METHOD Inflate the cuff to 30mmHg above the estimated systolic level.
Slowly deflate the cuff at a rate of 2-3mm/second, noting when the Korotkoff sounds appear (systolic) and disappear (diastolic) to the nearest 2mmHg.

↓

NUMBER OF READINGS For persons who are getting their blood pressure measured for the first time, it is preferable to take 3 readings, 1 – 2 minutes apart and to use the average of the 2nd & 3rd reading.

↓

HOW MANY? A minimum of 3 BP readings must be taken at the 1st visit to confirm hypertension.
Take the average of the 2nd & 3rd readings.

↓

HOW SERIOUS? Identify category of hypertension according to Table 1.

↓

Mild or moderate hypertension — Severe hypertension

↙ ↘

Proceed to clinical management — Manage as hypertensive emergency (page 37)

↙ ↘

Ensure the cuff and device are cleaned and stored according to local policy.

BP category*	Systolic BP mm Hg		Diastolic BP mm Hg
Normal	< 120	and	< 80
Optimal	120 - 129	and	< 80
High normal	130 - 139	or	80 - 89
Hypertension			
Mild (Grade 1)	140 - 159	or	90 - 99
Moderate (Grade 2)	160 - 179	or	100 - 109
Severe (Grade 3)	≥ 180	or	≥ 110
Isolated systolic	≥ 140	and	< 90
*Individuals with SBP and DBP in two categories should be designated to higher BP based on two or more careful readings obtained on 2 or more occasions.			

Table 1: Classification of hypertension (repeat from page 10)

The diagnosis of mild and moderate hypertension should be confirmed at an additional patient visit, usually 1 to 4 weeks after the first measurement. In general, hypertension is diagnosed if, on two visits on different days, the blood pressure is elevated.

'Malignant Hypertension' is a hypertension emergency (see page 37)

Target BP = Systolic ≤140mm Hg and Diastolic ≤90 mm Hg
This should be achieved and then maintained.

Other BP Measurement methods

- Home BP monitoring. This is where the patient has a BP measuring device at home and can use this device correctly.
- Ambulatory BP monitoring. This where a sphygmomanometer is attached to the patient and used to take BP readings over a 24-hour period, whether the patient is awake or asleep.

9. CLINICAL MANAGEMENT

Management of hypertension is not simply administering medication. The associated lifestyle factors must be brought to the patient's attention, as well as the importance of compliance to medication and resolutions to lifestyle modifications.

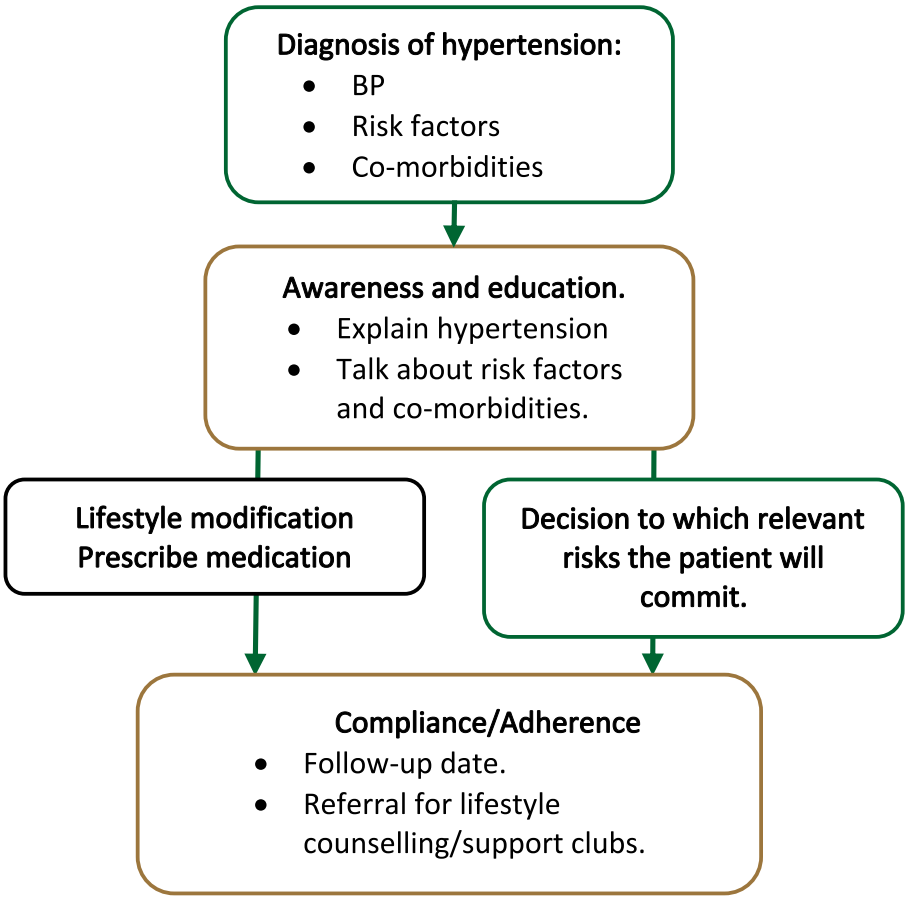


Fig 19: From diagnosis to maintenance

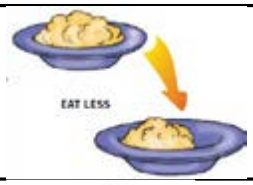
9.1. NON-MEDICATION THERAPY

There is clear evidence that there are risk factors which contribute towards the development of hypertension in adults (see section 5, page 12). Therefore, in a balanced approach to the clinical management of hypertension, lifestyle changes form part of the intervention to reduce elevated blood pressure in individuals.

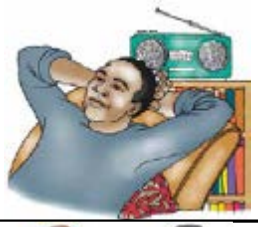
• PATIENT EDUCATION AND AWARENESS

It is important that the patient understands that there is a lot that he/she can do to help lower the blood pressure and improve health. By knowing what habits and practices can be changed to help lower the blood pressure, the patient can take better control of his/her health (42).

• LIFESTYLE MODIFICATION FOR HYPERTENSION

Lifestyle change	*Message*	*To share with the patient*
Get Physically active		• Start some physical activity. • 150 minutes per week. • Do the activities that you enjoy: walking, dancing, sport. *See Appendix A: Get more active.*
Eat healthy food	 *See Appendix B: Healthy eating*	• Eat a balanced diet. • Avoid pure sugar and food high in sugar (43) • Avoid sugar sweetened drinks (44) • Eat more vegetables and fruit. • Avoid starchy food, eat more whole grains. (45) • Avoid fats and foods high in these. • Avoid chips, white bread, biscuits, cake. • Include potassium rich foods see below#).
Eat smaller portions (46)		• Reduce the size of your plate. • Have smaller helpings.
Use less salt (47)		• Avoid food with high salt content. • Avoid adding salt to food.
Stop smoking/tobacco use		• Recognise that smoking/tobacco use is harmful. • Make a decision to stop. • Get help when needed.
Use alcohol in moderation		• Understand that too much alcohol is a problem. • Set a goal. • Get support. • Remove and avoid temptation.

- **MENTAL WELLNESS FOR HYPERTENSION**

Reduce stress		• Deal with the stress factors where possible. • Talk to someone you trust. • Develop good sleeping habits.
Commit to taking your medication regularly		• Take your treatment on time every day. • Do not miss a day. • Use a pill box. • Know the names of your medicine, and the side effects.

Potassium rich food: beans and peas, nuts, green leafy vegetables and fruit such as bananas, papayas and dates.

Myths and misconceptions of hypertension

Hypertension can be controlled by lifestyle changes alone.
While lifestyle modification may in some cases lower blood pressure to acceptable levels, for many people this is not sufficient. Those people whose blood pressure is not lowered by lifestyle alone will then require medication as well as lifestyle modification.

Hypertension is directly as a result of stress.
Stress is a contributing factor towards high blood pressure, but may not be the only cause.

If I have high blood pressure, I am sure to have a stroke.
Blood pressure can be controlled with lifestyle modification and medication, and does not have to lead to a stroke.

If you feel fine, you don't have hypertension.
This is far from true. About 1 in 6 people have no idea that their blood pressure is elevated.

If you don't salt your food, salt isn't a big issue for you.
Most salt in food isn't added at the last minute from your tabletop salt shaker. It is processed into the food during manufacturing.

When medication brings your blood pressure down, you can stop taking it.
Absolutely not! Never stop taking your medication without consulting your health care provider.

9.2. MEDICATION THERAPY

Follow the algorithm according to whether the patient is not yet on medication (Fig 19a) or on medication (Fig 19b):

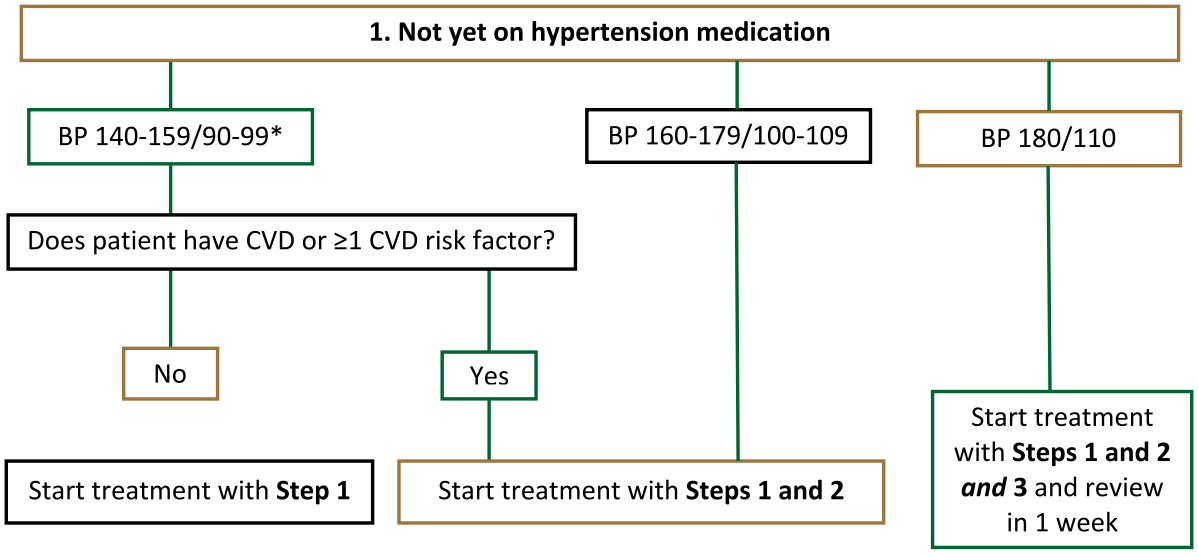


*Fig 20a: Algorithm of hypertension management for patients **not yet on medication***

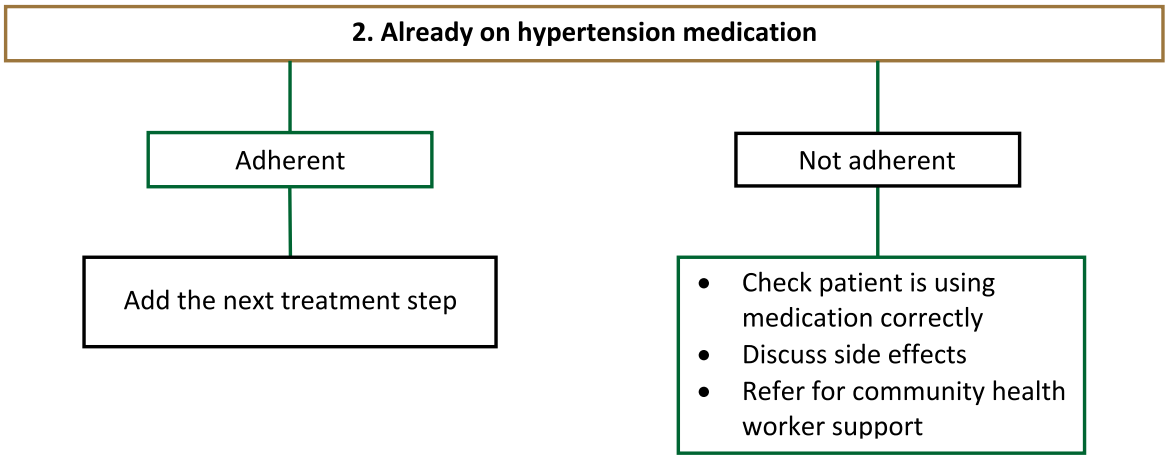


*Fig 20b: Algorithm of hypertension management for patients **already on medication***

* There is currently no evidence to support treating patients with systolic BP levels between 130 and 140 mmHg, without additional markers of CV risk, to a target BP < 130/80 mmHg (11).

Using the algorithm, based on whether the patient is not yet on medication or has already started medication, use the stepwise approach as laid out in the steps below (11).

In the use of pharmaceuticals, single dose combination medication is preferable and the protocols included here are flexible to amendments. However, this treatment regimen is aligned with WHO evidence-based treatment protocols according to GRADE [9] and the National Essential Medicines Committee-approved National Department of Health PHC STG (2020 edition). These protocols will be updated where necessary subject to this approval.}

STEP	Entry to Step 1	Treatment	Target
Step 1 Lifestyle modification	» Diastolic BP 90-99 mmHg and/or systolic BP 140-159 mmHg without any existing disease. **AND** » No major risk factors.	» Lifestyle modification.	✓ BP control within 3 months to <140/90 mmHg.

Target not achieved in 3 months

STEP	Entry to Step 2	Treatment	Target
Step 2 Add hydrochlorothiazide.	Diastolic BP 90-99 mmHg and systolic BP 140-159 mmHg without any existing disease. **AND** » No major risk factors. **AND** » Failure of lifestyle modification alone to reduce BP after 3 months. **OR** Mild hypertension with major risk factors or existing disease. **OR** Moderate hypertension at diagnosis.	» Lifestyle modification **AND** • Hydrochlorothiazide, oral, 12.5 mg daily.	✓ BP control within 1 month to <140/ Hydrochlorothiazide, oral, 12.5 mg daily 90 mmHg.

Target not achieved in 1 month

STEP	Entry to Step 3	Treatment	Target
Step 3 Add a second antihypertensive medicine.	» Failure to achieve targets in Step 2 after 1 month despite adherence to therapy. OR Severe hypertension (See Table 1).	» Lifestyle modification **AND** • Hydrochlorothiazide, oral, 12.5 mg daily. **PLUS** • Long-acting calcium channel blocker, e.g.: Amlodipine, oral, 5 mg daily. **OR** • ACE-inhibitor. e.g. Enalapril, oral, 10 mg daily	✓ BP control within 1 month to <140/90 mmHg.

[1]Grading of Recommendations, Assessment, Development and Evaluations is a framework for developing and presenting summaries of evidence and provides a systematic approach to recommendations.

Target not achieved in 1 month

STEP	Entry to Step 4	Treatment	Target
Step 4 Increase the dose of the second antihypertensive medicine.	» Failure to achieve targets in Step 3 after 1 month despite adherence to therapy.	» Lifestyle modification **AND** • Hydrochlorothiazide, oral, 12.5 mg daily. **PLUS** Increase dose of antihypertensive started in Step 3: • Long-acting calcium channel blocker, e.g. Amlodipine, oral, 10 mg daily. **OR** • ACE-inhibitor. e.g. Enalapril, oral, 20 mg daily	✓ BP control within 1 month to <140/90 mmHg.

Target not achieved in 1 month

STEP	Entry to Step 5	Treatment	Target
Step 5 Add a third antihypertensive medicine.	» Failure to achieve targets in Step 4 after 1 month despite adherence to therapy.	» Lifestyle modification **AND** • Hydrochlorothiazide, oral, 12.5 mg daily. **PLUS** • ACE-inhibitor, e.g. Enalapril, oral: continue Step 4 dose, or if not started previously start at 10 mg daily. **PLUS** • Long-acting calcium channel blocker, e.g. Amlodipine, oral: continue Step 4 dose, or if not started previously start at 5 mg daily.	✓ BP control within 1 month to <140/90 mmHg with no adverse medicine reactions

Target not achieved in 1 month

STEP	Entry to Step 6	Treatment	Target
Step 6 Increase the dose of the third antihypertensive medicine.	» Failure to achieve targets in Step 5 after 1 month despite adherence to therapy.	» Lifestyle modification **AND** • Hydrochlorothiazide, oral, 12.5 mg daily. **PLUS** • ACE-inhibitor, e.g. Enalapril, oral 20 mg daily. **PLUS** • Long-acting calcium channel blocker, e.g. Amlodipine, oral: 10 mg daily.	✓ BP control within 1 month to <140/90 mmHg with no adverse medicine reactions

Target not achieved in 1 month

STEP	Entry to Step 7	Treatment	Target
Step 7 Increase the dose of HCTZ and add a fourth antihypertensive medicine	Failure to achieve targets in Step 6 after 1 month despite adherence to therapy	» Lifestyle modification **AND** • Hydrochlorothiazide, oral, 25 mg daily. **PLUS** • ACE-inhibitor, e.g.: Enalapril, oral 20 mg daily. **PLUS** • Long-acting calcium channel blocker, e.g.: Amlodipine, oral: 10 mg daily. **AND PLUS** **ADD** • Spironolactone, oral, 25 mg daily (Doctor initiated).	✓ BP control within 1 month to <140/90 mmHg with no adverse medicine reactions

CAUTION

Spironolactone can cause severe hyperkalaemia and should only be used when serum potassium can be monitored.
Do not use together with potassium supplements.
Do not use in kidney failure (Do not use if eGFR < 30 mL/min).

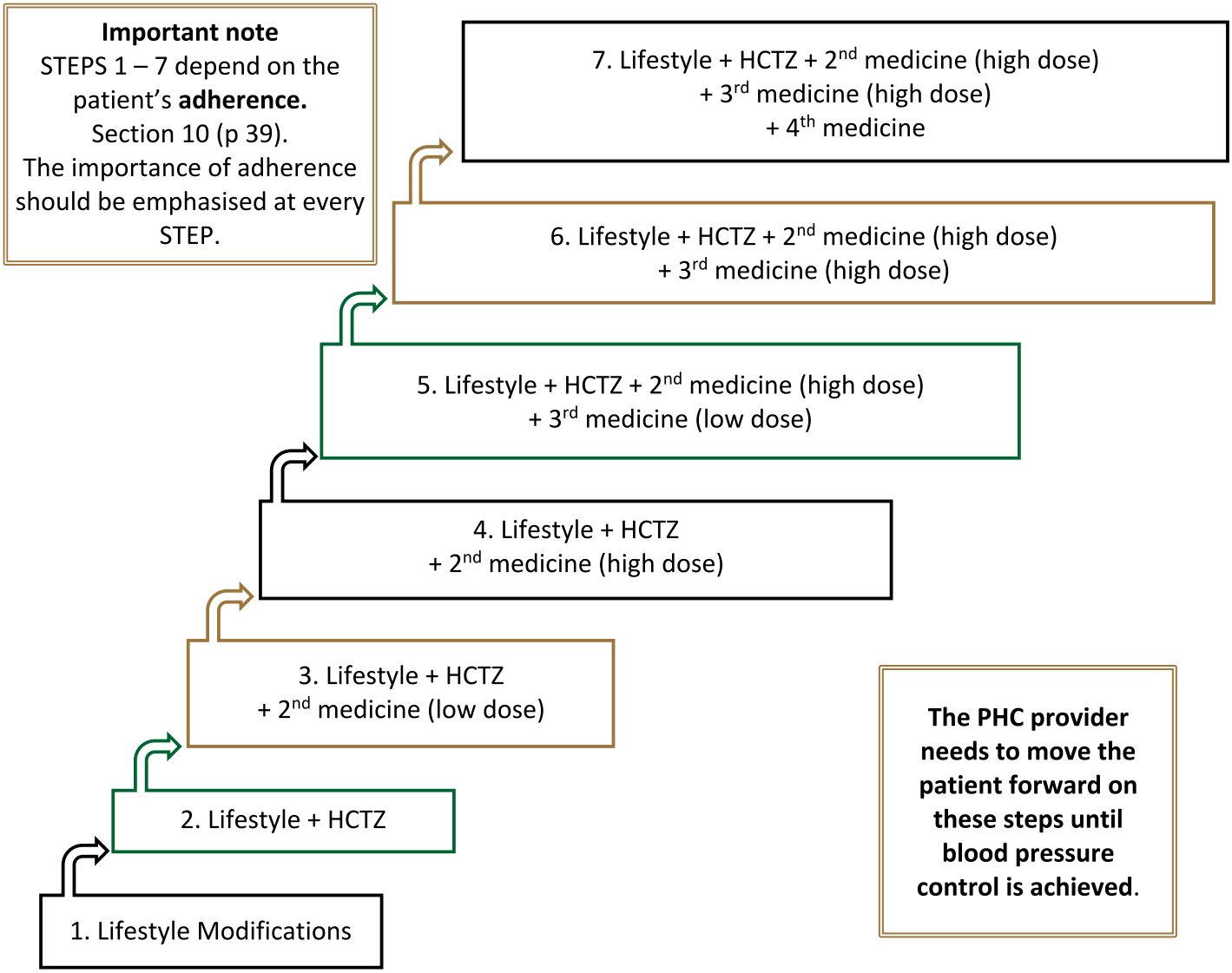


Fig 21: Summary of the stepped approach to medication

Note: The use of fixed dose combination medication for control of hypertension provides greater adherence and such agents should be used when they are available.

Asymptomatic severe hypertension

These patients have severe hypertension, are asymptomatic and have no evidence of progressive target organ damage.

Management
Observe the patient in the health care setting and repeat BP measurement after the patient has rested for 1 hour.

If the second measurement is still elevated at the same level, start oral treatment with 2 agents (Step 3), one of which should be low dose hydrochlorothiazide and the second medicine is usually a calcium channel blocker, e.g., amlodipine.

- Patient should be followed up within a week.
- Refer to doctor if BP >160/100 mmHg after 4 weeks.

Contraindications to individual medicines

Medication	Condition where this medication is contraindicated	Conditions when to take caution / risks
Hydrochlorothiazide	➢ Gout ➢ Pregnancy ➢ Severe liver impairment ➢ Kidney impairment	➢ Diabetes ➢ Hypokalemia
Calcium channel blockers	➢ Untreated heart failure	➢ HIV
ACE inhibitors	➢ Pregnancy ➢ Bilateral renal artery stenosis or stenosis of an artery to a dominant/single kidney ➢ Aortic valve stenosis ➢ Severe renal impairment (eGFR<30mL/min)	➢ Possibility of a persistent cough ➢ Advise all patients receiving ACE-inhibitors about the symptoms of ACE-induced angioedema ➢ Hyperkalemia
Spironolactone	➢ Kidney impairment (eGFR<30mL/min) ➢ Pregnancy	

Table 2: Contraindications and caution to individual medicines

• MONITORING

Regular BP monitoring is essential in patients who have been diagnosed with hypertension (39).

At first visit:

- BMI or weight change
- Blood pressure

Baseline:

- Urine protein by dipstix.
  If dipstix positive for urine protein, send blood for serum creatinine concentration (and eGFR)
- BMI for cardiovascular risk assessment
- Abdominal circumference.
- Serum potassium concentration, if on ACE-inhibitor or eGFR < 30 mL/min

At every visit:

- BMI or weight change
- Blood pressure

Six monthly:

- Serum potassium concentration in patients on spironolactone or eGFR < 30 mL/min.

Annually:

- Fingerprick blood glucose
- Urine protein by dipstix
- Serum creatinine concentration (and eGFR) in patients who have:
  - proteinuria 1+ or more
  - existing cardiovascular disease
  - hypertension present for 10 years or more (annually if uncontrolled)
  - chronic kidney disease (eGFR < 60 mL/min)

Review the patient monthly until BP controlled. Once controlled, review 6 monthly
If BP not controlled after 1 month on Step 7, refer.

- **REFERRAL**

  The following patients must be referred to the district hospital services:

- Young adults (<30 years of age).
- BP not controlled by 4 drugs and where there is no doctor available, despite adherence
- Signs of target organ damage (TOD) e.g., Oedema, dyspnoea, proteinuria, angina etc.
- If severe adverse drug reactions develop.
- Hypertensive urgency and hypertensive emergency.
- Ensure that pregnant women are enrolled in antenatal clinic.

RESISTANT HYPERTENSION (14)

This is a frequent phenomenon in patients with hypertension and must be born in mind.
The strongest risk factors for resistant hypertension are older age and obesity.
Other co-morbidities can also play a role.

Diagnostic criteria

- >140/90 despite the use of 4 anti-hypertensive drugs in a rational combination and including a diuretic.
- Exclude poor medication adherence and white coat hypertension

The plan of therapy must be to ensure:

1. Good technique to measure blood pressure
2. Adherence to medication
3. Adherence to lifestyle changes

If this is in place and the blood pressure remains high, then the patient needs to be referred.

9.3 HYPERTENSIVE EMERGENCY

A hypertensive emergency/crisis is a severe increase in blood pressure that can lead to a stroke or other cardiovascular damage.

This is a markedly elevated BP: systolic BP > 180 mmHg and/or a diastolic BP > 110 mmHg (9), associated with end-organ damage, e.g., retinopathy.

Another term for this is malignant hypertension.

At BP >170 mm Hg systolic and/or >110 mm Hg diastolic: immediate hospitalization is indicated. Patients who experienced a hypertensive emergency are at increased risk of cardiovascular and renal disease.

Causes and consequences of a hypertensive emergency may include::

- The patient forgets to take his/her blood pressure medication.
- The patient does not attend follow-up and runs out of medication.
- Interaction between medications.
- Stroke.
- Heart attack.
- Heart failure.
- Kidney failure.
- Rupture of the aorta.
- Convulsions during pregnancy (eclampsia).

Signs of a hypertensive emergency (11) may include:

- Chest pain
- Shortness of breath
- Blurred vision
- Mental status changes
- Reduced urine output
- Nausea and/or vomiting
- Lethargy
- Seizures
- Papilledema
- Focal neurologic signs
- Signs of heart failure
- Other non-specific presentations.

Specific clinical presentations of hypertensive emergency also include (14):

- **Malignant hypertension:** Severe BP elevation (commonly >200/120 mm Hg) associated with advanced bilateral retinopathy (haemorrhages, cotton wool spots, papilledema).

- **Hypertensive encephalopathy:** Severe BP elevation associated with lethargy, seizures, cortical blindness and coma in the absence of other explanations.

- **Hypertensive thrombotic microangiopathy:** Severe BP elevation associated with haemolysis and thrombocytopenia in the absence of other causes and improvement with BP-lowering therapy.

Hypertension may also present as:

Cerebral haemorrhage.
Acute stroke.
Acute coronary syndrome.
Cardiogenic pulmonary oedema.
Aortic aneurysm/dissection.
Severe preeclampsia and eclampsia.

A hypertensive emergency may be associated with hypertension-mediated organ damage (HMOD). Target organs include the retina, brain, heart, large arteries, and the kidneys. In the case of hypertension and HMOD, immediate intervention is needed to reduce BP and prevent progressive organ failure (14). Thorough investigation of potential underlying causes and assessment of HMOD is mandatory to avoid recurrent presentations with hypertensive emergencies.

Regular and frequent follow-up (monthly) is recommended until target BP and ideally regression of HMOD has been achieved.

In addition, adjustment and simplification of antihypertensive therapy paired with advice for lifestyle modification will assist to improve adherence and long-term BP control.

Emergency Medicine treatment in PHC presentation:

- Administer Amlodipine, oral, 10 mg immediately as a single dose.

If pulmonary oedema:

- Administer Furosemide, IV, 40 mg as a single dose

Refer all patients. A hypertensive emergency needs immediate referral to hospital

Early recognition, resuscitation and referral of patients with acute cardiovascular emergencies (including a hypertensive emergency) is essential. (11)

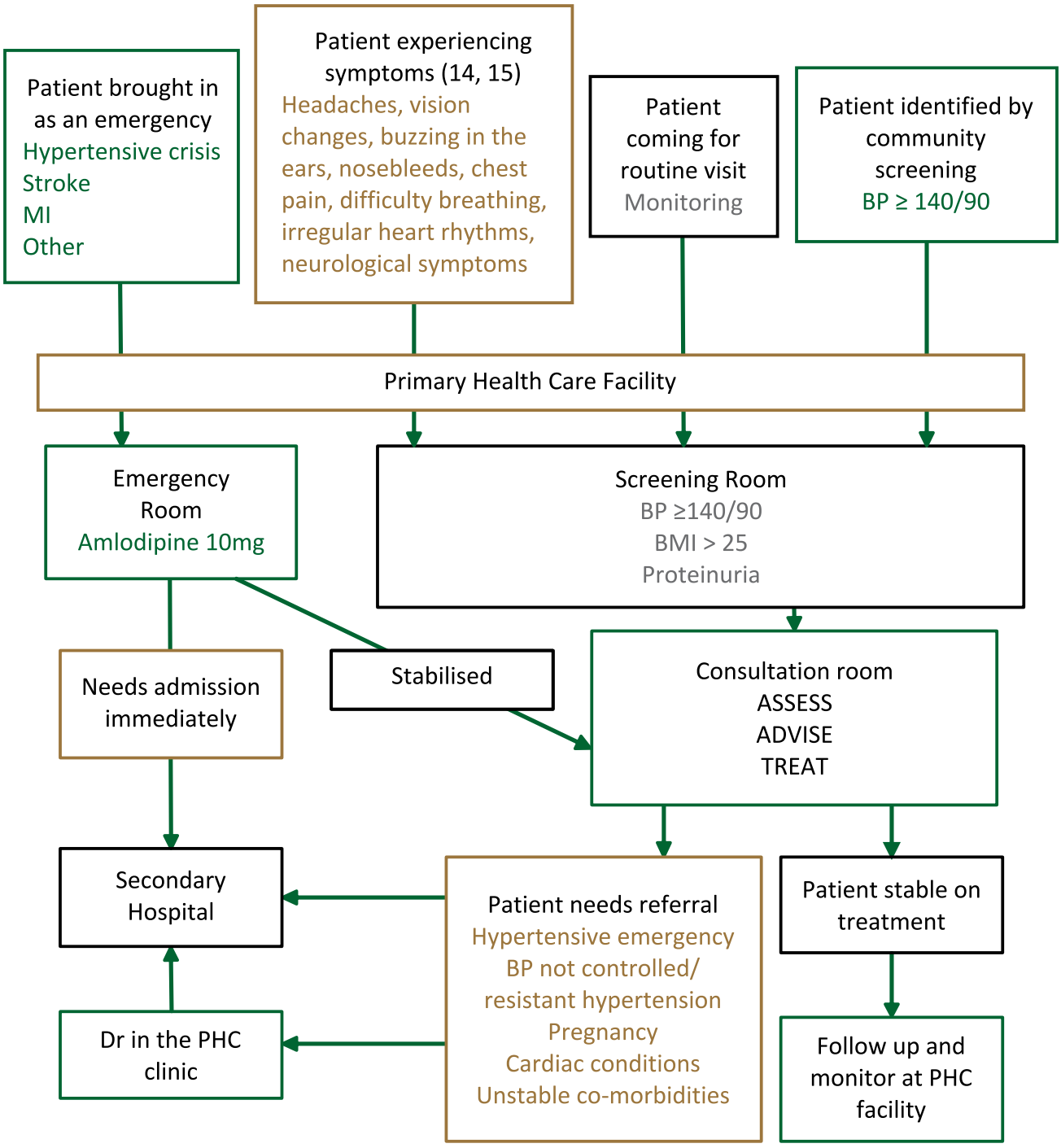


Fig 22: A summary of the referral pathways for patients diagnosed with hypertension at PHC level.

10. COMPLIANCE AND ADHERENCE TO MEDICATION

Improving adherence might be the best investment for tackling chronic conditions effectively (48).

What is adherence?

Adherence means taking medication every day and keeping appointments. Good adherence is not just taking medication regularly, it is working with the health care provider to manage the condition. Adherence is not just being told what to do (compliance). Many people experience difficulties in following treatment. Patients need to be supported, not blamed.

Interventions that may improve adherence

- Provide information on the risks of hypertension and the benefits of treatment.
- Agree on a treatment strategy to achieve and maintain BP control using lifestyle measures and medication (a single-pill-based treatment strategy when possible).
- Simplification of the drug regimen favouring the use of single pill combination therapy.
- Identify and help the individual to resolve barriers to adherence.
- Accessibility to appropriate medications.
- Self-management, with simple patient-guided systems.

Key messages to patients

- Take your medication at the right dose, the right frequency, and the right time.
- Feeling better is not a reason to stop taking your medication, it means that it is working!
- Alternatives to medication for your chronic condition may not always be better.
- Poor adherence has a bad effect on whether the medication will work. It can be life threatening.
- Good adherence makes you safe.

What makes adherence difficult?

The kind of disease you have
Social problems
Financial and transport problems
A complex medication schedule/multiple medication
Blame from your health carer if you slip up

What makes adherence easier?

Knowing about your disease
A positive attitude towards your chronic disease
Family support
Support from friends and community
Adherence clubs
Support from your health carers
Collecting your medication near your home

Adherence tools

A pill counter	A calendar	Your cell phone
		

Adherence clubs

- Are run by a health worker.
- Meet regularly.
- Provide the support of others.
- Are a place to make new friends.
- Supply pre-packed medication.
- Avoid long waits at the clinic.

11. ROLE OF CHWS AND OTHER ALTERNATIVE TREATMENT SOURCES AND OPTIONS.

Community Health Workers (CHWs) are part of the ward-based outreach teams (WBOTS) of a PHC facility.

The CHWs visit, support and engage with:

- Individuals
- Families
- Households
- Adherence clubs and support groups
- Community forums and events (including screening events)

They provide:

(i) Health promotion on healthy lifestyle changes which are so necessary to decrease the effect of chronic diseases on people's lives.

Health promotion is the process of enabling people to take control over their own health, and the factors that determine their health, so that their health stabilises and improves.

(ii) Support for members of the community to adhere to their medication.

The CHWs can act as a bridge between the formal health service and the community, and so should form an important part of a balanced approach to address the high rate of cardiovascular disease, especially Hypertension in the population.

See Health for All: A health promotion tool for community health workers pp 134-7 (30).

12. HYPERTENSION MANAGEMENT IN SPECIAL POPULATIONS

12.1 HYPERTENSION AND DIABETES

Diabetes type 2 may commonly occur along with Hypertension in patients with the following risk factors (23):

- overweight/obesity
- physical inactivity
- having a first-degree relative with diabetes
- history of gestational diabetes, or preeclampsia
- history of CVD, HTN, dyslipidaemia, or polycystic ovary syndrome.

Symptoms of diabetes include (12):

- polyuria (excessive passing of urine)
- polydipsia (excessive thirst)
- unexplained weight loss
- polyphagia (excessive hunger)
- vision changes
- fatigue
- susceptibility to infections, especially of the urinary tract, respiratory tract and skin

Diagnosing Diabetes

Type 1 diabetes mellitus is diagnosed when the classic symptoms of polyuria and polydipsia are associated with hyperglycaemia.

On average, people have type 2 diabetes (with or without symptoms) for between five and seven years before it is diagnosed.

It is therefore important to test all adults who are 40+ years old and who are overweight (BMI >25) or obese (BMI >30) (12).

» Random blood glucose ≥11.1 mmol/L.
» Random is defined as any time of day without regard to time since last meal.
OR
» Fasting blood glucose ≥7.0 mmol/L.
» Fasting is defined as no caloric intake for ≥8 hours.

Type 2 diabetes mellitus is a chronic debilitating metabolic disease characterised by hyperglycaemia with serious acute and chronic complications. It is an important component of the metabolic syndrome.

In adults the condition might be diagnosed when presenting with complications, e.g.:

» ischaemic heart disease
» deteriorating eyesight
» peripheral artery disease » foot ulcers
» stroke » erectile dysfunction.

Metabolic syndrome

Abdominal obesity is a waist circumference >94 cm in men, and > 80 cm in women

BMI is determined by weight in kg/height in m^2

18.5 – 24.9	Normal
25.0 – 29.9	Overweight
30.0 – 34.9	Mildly obese
35 – 39.9	Moderately obese
>40	Extremely obese

A decrease in food intake together with an increase in physical activity is crucial to losing weight.

BP lowering in hypertensive patients reduces cardiovascular risk. The diagnosis of hypertension is confirmed if the blood pressure remains > 140/90 mmHg on two separate days.

Statins are recommended for all people with type 2 diabetes older than 40 years, but only if this does not negatively impact access to glucose-lowering and blood pressure-lowering medication (12).

Non-glycaemic targets of Diabetes management are:

» Lifestyle changes.
» Body mass index ≤ 25 kg/m2.
» BP ≤ 140/90 mmHg and ≤ 120/70 mmHg.

STEP	Entry to Step 1	Treatment	Target
Step 1 Lifestyle modification	» Diastolic BP 90-99 mmHg and/or systolic BP 140-159 mmHg without any existing disease. **AND** » No major risk factors.	» Lifestyle modification.	✓ BP control within 3 months to <140/90 mmHg.

Target not achieved in 3 months

STEP	Entry to Step 2	Treatment	Target
Step 2 Add ACE inhibitor.	Diastolic BP 90-99 mmHg and systolic BP 140-159 mmHg without any existing disease. **AND** » No major risk factors. **AND** » Failure of lifestyle modification alone to reduce BP after 3 months. **OR** Mild hypertension with major risk factors or existing disease. **OR** Moderate hypertension at diagnosis.	» Lifestyle modification **AND** • ACE-inhibitor. e.g.: Enalapril, oral, 10 mg daily	✓ BP control within 1 month to <140/90 mmHg.

Target not achieved in 1 month

STEP	Entry to Step 3	Treatment	Target
Step 3 Increase the dose of the ACE inhibitor	» Failure to achieve targets in Step 2 after 1 month despite adherence to therapy.	» Lifestyle modification **AND** Increase dose of ACE-inhibitor. e.g.: Enalapril, oral, 20 mg daily	✓ BP control within 1 month to <140/90 mmHg.

STEP 4	Entry to Step 4	Treatment	Target
Step 4 Add Hydrochlorothiazide	» Failure to achieve targets in Step 2 after 1 month despite adherence to therapy.	» Lifestyle modification **AND** • ACE-inhibitor. e.g.: Enalapril, oral, 20 mg. Daily **AND** • Hydrochlorothiazide, oral, 12.5 mg daily.	✓ BP control within 1 month to <140/90 mmHg.

Target not achieved in 1 month

Refer to specialist

Important note
STEPS 1 – 4 depend on the patient's **adherence.**
Section 10 (p 35).
The importance of adherence should be emphasised at every STEP.

12.2 HYPERTENSION IN PREGNANCY

Hypertensive disorders of pregnancy are the most frequent direct cause of maternal mortality in South Africa (49). This important fact should always be included in health information and education provided during visits for antenatal care, labour or in the puerperium. This information should also be given to communities and relatives of pregnant women (30).

Early detection and timely intervention are essential to prevent maternal and perinatal complications.

DEFINITION OF HYPERTENSION IN PREGNANCY
Blood Pressure ≥140/90 mmHg or more, on 2 occasions at least 2-4 hours apart (49, 50).
OR
A systolic BP ≥ 160 and/or a diastolic BP ≥ 110 mmHg measured on a single occasion.

DEFINITION OF PROTEINURIA
- The presence of 1+ proteinuria or more on reagent strip (dipstick) testing on clean catch urine specimens taken at least 4 hours apart and persisting through pregnancy
- or
- Protein excretion ≥300 mg in a 24-hour specimen of urine (50).

KEY TERMS OF HYPERTENSIVE DISORDERS OF PREGNANCY

Essential hypertension: hypertension without proteinuria diagnosed before 20 weeks of pregnancy, or a history of essential hypertension prior to the pregnancy.

Chronic kidney disease (CKD): hypertension with proteinuria, diagnosed before 20 weeks of pregnancy, or a history of chronic renal disease prior to the pregnancy.

Gestational hypertension: hypertension without proteinuria, detected after 20 weeks of pregnancy.

Pre-eclampsia: hypertension with proteinuria, both detected for the first time after 20 weeks of pregnancy

Unclassified hypertension: hypertension detected in a woman in whom the BP was not measured before 20 weeks of pregnancy. This may be with proteinuria or without proteinuria.

Superimposed pre-eclampsia: pre-eclampsia that develops in a woman with chronic hypertension or chronic renal disease.

Chronic hypertension: If hypertension occurs *before 20 weeks of gestation*, it is most likely chronic hypertension. Because some women's blood pressure might not be measured before 20 weeks of gestation, chronic hypertension may be identified for the first-time during pregnancy after 20 weeks of gestation. Chronic hypertension will persist beyond 12 weeks postpartum (50).

Measurement of blood pressure in pregnancy

- The right and left lying semi-lateral, and sitting positions are acceptable.
- The supine position (lying flat on the back) should not be used after 24 weeks.
- Use the correct cuff size.
- Ensure that the cuff is at the level of the heart during measurement.
- Take the diastolic blood pressure at the point where the sounds disappear (Korotkoff phase 5).

  In patients where the sounds do not disappear, use the point of muffling (Korotkoff phase 4).

CHRONIC HYPERTENSION

If hypertension occurs *before 20 weeks of gestation*, it is most likely chronic hypertension. Because some women's blood pressure might not be measured before 20 weeks of gestation, chronic hypertension may be identified for the first-time during pregnancy after 20 weeks of gestation. Chronic hypertension will persist beyond 12 weeks postpartum (51).

The following must be reviewed on a weekly basis:

- BP - height of fundus
- weight - fetal heart rate and movements
- urine analysis (39)

Educate the patient on signs requiring urgent follow-up (headache, epigastric pain, visual disturbances, vaginal bleeding etc).

Medicine treatment

Methyldopa, oral, 250 mg 8 hourly.

- Titrate to a maximum dose: 750 mg 8 hourly.
- When using iron together with methyldopa, ensure that iron and methyldopa are not taken concurrently.

Referral

- All patients with gestational hypertension at 38 weeks for delivery.
- Pre-eclampsia (all levels of severity).
- Poor control of hypertension.
- Severe hypertension

Classification of hypertensive disorders of pregnancy

HYPERTENSION	Onset before 20 weeks	Onset after 20 weeks
With no proteinuria	Essential hypertension	Gestational hypertension
With proteinuria	Chronic renal disease	Pre-eclampsia

Table 3: Hypertensive disorders of pregnancy

GRADES OF PRE-ECLAMPSIA

- **Mild pre-eclampsia:** a diastolic BP of 90-109 mmHg, with 1+ or 2+ proteinuria.
- **Severe pre-eclampsia:** a diastolic BP of ≥110 mmHg and ≥1+ proteinuria, or 3+ proteinuria irrespective of the level of BP, or organ dysfunction irrespective of the level of BP or amount of proteinuria.
- **Imminent eclampsia:** symptoms and signs that develop in a pre-eclamptic woman, i.e., severe headache, visual disturbances, epigastric pain, hyperreflexia, dizziness and fainting, vomiting.
- **Eclampsia:** generalised tonic-clonic seizures after 20 weeks of pregnancy and within 7 days after delivery, associated with hypertension and proteinuria.
- **HELLP syndrome:** the presence of haemolysis, elevated liver enzymes and low platelets, almost always in association with hypertension and proteinuria.

Important to remember:

- A small proportion of women with eclampsia have normal blood pressure. Treat all women with convulsions as if they have eclampsia until another diagnosis is confirmed.
- Pre-eclampsia often has no symptoms, so it is important to be vigilant with any woman with hypertension in pregnancy and to watch for the subtle or overt onset of symptoms that suggests worsening of disease.
- Oedema of the feet and lower extremities is not considered a reliable sign of pre-eclampsia.
- Calcium supplementation should be given to all pregnant women. The dose is 1gm elemental calcium oral 12 hourly, with a 2-hour gap between iron and calcium intake (39).

WOMEN AT RISK FOR THE DEVELOPMENT OF PRE-ECLAMPSIA

All pregnant women may develop pre-eclampsia. Those most susceptible may be/have:

Women of age 35 and above.
Adolescent
Primigravidae, in particular teenagers and elderly primigravidae.
Multigravida.
Women with a previous pregnancy complicated by pre-eclampsia.
Obese
Chronic hypertension
Kidney disease
Diabetes
Women with a previous abruptio placentae.
Preeclampsia in a previous pregnancy

If severe pre-eclampsia or imminent eclampsia:

Imminent eclampsia is pre-eclampsia with severe persistent headache, visual disturbances, epigastric pain (not discomfort), hyper-reflexia or clonus.

General measures

- Advise all pregnant patients to urgently visit the clinic if severe persistent headache, visual disturbances, epigastric pain (not discomfort).
- If severe pre-eclampsia or imminent eclampsia:
  - Insert a Foley's catheter and monitor urine output hourly.
  - Monitor BP and check reflexes every 30 minutes
- Magnesium sulphate, IV, 4 g as a loading dose diluted with 200 mL sodium chloride 0.9% and infused over 20 minutes.

PLUS

- Magnesium sulphate, IM, 10 g given as 5 g in each buttock.

CAUTION: USE OF MAGNESIUM SULFATE

Stop magnesium sulphate if knee reflexes become absent or if urine output < 100 mL/4 hours or respiratory rate < 16 breaths/minute.

If respiratory depression occurs:

Calcium gluconate 10%, IV, 10 mL given slowly at a rate not > 5 mL/minute

PLUS

If systolic BP ≥ 160 and/or a diastolic BP ≥ 110 mmHg:

- Nifedipine, oral, 10 mg (not sublingual) as a single dose.
  May be repeated after 30 minutes if diastolic BP remains at 110 mmHg.

REFERRAL

Urgent

Severe pre-eclampsia and imminent eclampsia

Non urgent

All women with pre-eclampsia (within 24 hours).

MANAGEMENT OF HYPERTENSION IN PREGNANCY AT PHC LEVEL (49)

Signs	*Definition/features*	*Action*
Borderline BP levels/pre-hypertension	BP = 135/85 - 139/89 mmHg (pre-hypertension)	BP should then be repeated within 30 minutes-2 hours and, if still borderline, the patient should be asked to return within 3 - 7 days. If the blood pressure is normal on repeat measurement, the woman can be followed up as a low-risk patient.
Hypertension with no risk factors	No proteinuria No symptoms	Start methyldopa (500 mg 8-hourly) and send to next level of expertise within 3 days.
Hypertension with risk factors but no proteinuria	Risk factors: • Prior pre-eclampsia • Chronic hypertension • Multiple gestation • Pre-gestational diabetes • Maternal BMI >33 • Anti-phospholipid syndrome/systemic lupus erythematosus (SLE) • Assisted reproduction therapies	Refer to District hospital (DH) Start low-dose aspirin. (Hb, platelets, creatinine, and a sonar for foetal evaluation need to be done).
Women with hypertension <32 weeks' gestational age.		Refer to a DH for investigation for pre-eclampsia.
Hypertension with proteinuria (≥1+), no severe features.		Same-day referral to nearest hospital accredited for caesarean delivery. Inform receiving hospital Give magnesium sulphate if receiving doctor suggests it.
Pre-eclampsia with severe features.	Headache Chest/epigastric pain/discomfort Visual disturbances/eclampsia *or* BP ≥160/110 mmHg	Stabilise woman as described below*:

Action for pre-eclampsia with severe features:

- Inform receiving hospital (regional or tertiary).
- Start one IV line with 200 mL normal saline (whichever is available); run IV line slowly, it is just for access.
- If doctor is present, start magnesium sulphate (4 g intravenous infusion (IVI) in 200 mL normal saline over 20 minutes, plus 10 g intramuscular injection (IMI) (5 g in each buttock).
- Administer 1 g methyldopa orally.
- Insert a urinary catheter and monitor urine output every hour until the woman is transferred.
- Monitor the woman's BP, pulse and respiratory rate every 15 minutes until she is transferred.
- Emergency transfer ideally accompanied by an experienced nurse if available. Use the SBAR (Situation, Background, Assessment, Recommendation) form to provide the necessary information.
- Woman must be monitored and transferred in the lateral position.

12.3. HYPERTENSION AND HIV/AIDS

In 2019 there were an estimated 7.5 million people living with HIV in South Africa (52). The co-existence of HIV with hypertension and diabetes is increasing. Heart disease and high blood pressure are major health concerns for people with HIV.

It is important to:

i. Screen for major NCDs among patients with HIV.
ii. To identify and manage HIV patients who have NCD co-morbidities.
iii. Identify and prevent drug interactions with HAART. (53).

It is therefore essential that BP is carefully monitored in patients receiving HAART. Prolonged highly active antiretroviral therapy (HAART) may be associated with a higher prevalence of systolic hypertension. These patients should also be screened for associated glomerulonephritis with eGFR.

Two of the three major classes of antiretroviral drug, the protease inhibitors and the non-nucleoside reverse transcriptase inhibitors, are involved in many drug interactions. Calcium channel blockers are the major class of antihypertensives affected by such drug interactions, leading to inhibition or induction of their metabolism. Ritonavir can increase the effect of amlodipine which may result in an increased response, i.e. lowering of the blood pressure. If administration for both Rotinivir and Amlodipine is indicated, then amlodipine should be started at a low dose with careful increase and monitoring of the blood pressure, as well as any side effects (54).

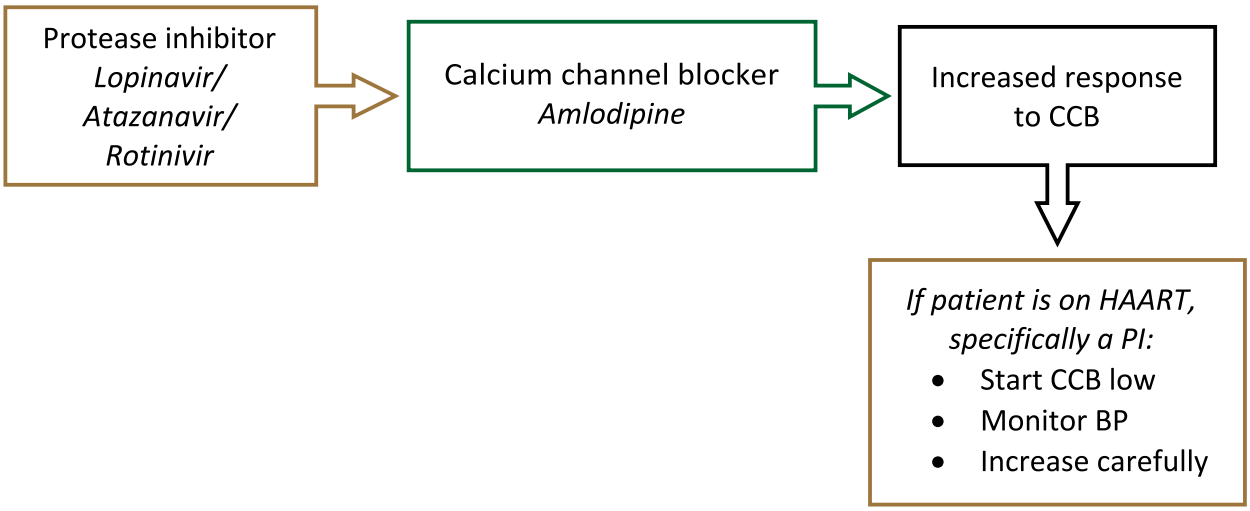


Fig 23: Prescribing a protease inhibitor together with a calcium channel blocker.

12.4. KNOWN EXISTING CARDIOVASCULAR CONDITIONS AND REFERRAL

Shown below are the most common cardiovascular conditions that may occur concurrently with or as a result of hypertension (55). **Suspicion of any of these conditions require referral.**

Cerebrovascular disease/Stroke	The blood supply to part of the brain is interrupted or reduced, preventing brain tissue from getting oxygen and nutrients. (See section 13).	Fainting or unconsciousness Trouble speaking and understanding what others are saying Paralysis or numbness of the face, arm or leg Problems seeing in one or both eyes Headache Trouble walking
Left Ventricular Hypertrophy (LVH)	Enlargement and thickening (hypertrophy) of the walls of the left ventricle.	Shortness of breath Fatigue Chest pain, often after exercising Sensation of rapid pulse, Palpitations Dizziness or fainting

Heart Failure/Congestive heart failure	The heart is too weak or stiff to fill and pump efficiently.	Dyspnoea on exertion Fatigue and weakness Oedema Rapid or irregular heartbeat Persistent cough or wheezing with white or pink blood-tinged phlegm Increased need to urinate at night Ascites Rapid weight gain from fluid retention Lack of appetite and nausea Sudden, severe shortness of breath Chest pain
Coronary Artery Disease/Myocardial infarction (MI)	Blood flow to the heart is reduced, preventing the heart muscle from receiving enough oxygen. The reduced blood flow is usually the result of a partial or complete blockage of the coronary arteries.	Neck or jaw pain Shoulder or arm pain A fast heartbeat Shortness of breath with activity Nausea and vomiting Sweating Fatigue
Atrial Fibrillation (AF)	An irregular and often rapid heart rate that can increase the risk of strokes, heart failure and other heart-related complications.	Palpitations Reduced ability to exercise Fatigue Light-headedness Dizziness Shortness of breath Chest pain
Peripheral Arterial Disease (PAD)	Peripheral artery disease (also called peripheral arterial disease) is a common circulatory problem in which narrowed arteries reduce blood flow to the limbs.	Painful cramping in hips, thighs or calf muscles Leg numbness or weakness Coldness in the lower leg or foot, especially when compared with the other side Sores on the toes, feet or legs that won't heal A change in colour of the legs Hair loss or slower hair growth on the feet and legs, shiny skin on the legs Slower growth of the toenails No pulse/weak pulse in your legs or feet Erectile dysfunction in men Pain when using the arms, aching and cramping when doing manual tasks

12.5. HYPERTENSION IN CHILDREN AND ADOLESCENTS

Hypertension in children and adolescents is an important issue beyond the scope of this user guide.

However, diseases of lifestyle are on the increase in adolescents. From 1975 to 2016, the prevalence of overweight or obese children and adolescents aged 5–19 years increased more than four-fold from 4% to 18% globally. (56).

In South Africa, a study in Tshwane showed a prevalence of adolescent obesity at 8.57% (57) This increased obesity in this age group is related to the international trend of poor diet and lack of exercise in children, with the possibility of early onset of hypertension and even type 2 diabetes (58). The early recognition of hypertension in these adolescents will be an important motivation for both children and parents to institute important lifestyle changes.

13. COMPLICATIONS OF HYPERTENSION

The complications of hypertension are serious. They are life threatening and can lead to sudden death in the case of a stroke or myocardial infarction. But even in the case of complications that do not cause immediate death, they can cause disability and significantly impact a person's quality of life. A stroke, heart attack or kidney failure can possibly render a person with a compromised lifestyle, the inability to work or even function independently.

The most common complications of Hypertension include:

- **STROKE**

A stroke occurs when the blood supply to part of the brain is interrupted or reduced, preventing brain tissue from getting oxygen and nutrients. Brain cells begin to die in minutes. A stroke is a medical emergency, and prompt treatment is crucial. Early action can reduce brain damage and other complications (59).

Signs and symptoms of a stroke may include:

- Fainting or unconsciousness.
- Trouble speaking and understanding what others are saying
- Paralysis or numbness of the face, arm or leg.
- Problems seeing in one or both eyes.
- Headache.
- Trouble walking (60).

A Transient Ischemic attack (TIA)

A TIA is a temporary period of symptoms similar to those of a stroke. A TIA usually lasts only a few minutes and doesn't cause permanent damage. Often called a 'mini stroke', a transient ischemic attack may be a warning. About 1 in 3 people who has a transient ischemic attack will eventually have a stroke, with about half occurring within a year after the transient ischemic attack. A transient ischemic attack can serve as both a warning of a future stroke and an opportunity to prevent it.

• HEART ATTACK

A heart attack occurs when the flow of blood to the heart is blocked. The blockage is most often a build-up of fat, cholesterol and other substances, which form a plaque in the arteries that feed the heart (coronary arteries).

Signs and symptoms of a heart attack may include:

- Pressure, tightness, pain, or a squeezing or aching sensation in the chest or arms that may spread to the neck, jaw or back
- Nausea, indigestion, heartburn or abdominal pain
- Shortness of breath
- Cold sweat, becoming pale
- Fatigue
- Light headedness or sudden dizziness

Heart attack symptoms can vary widely. For instance, there may only be minor chest discomfort while someone else has excruciating pain. One thing applies to everyone, though: If a heart attack is suspected, call the emergency help services number. If there is no access to emergency medical services, get to the nearest health facility as soon as possible.

• HEART FAILURE

Heart failure, sometimes known as congestive heart failure, occurs when the heart muscle doesn't pump blood as well as it should. Certain conditions, such as narrowed arteries in the heart (coronary artery disease) or high blood pressure, gradually leave the heart too weak or stiff to fill and pump efficiently.

Not all conditions that lead to heart failure can be reversed, but treatments can improve the signs and symptoms of heart failure and help the patient live longer. Lifestyle changes — such as exercising, reducing sodium in your diet, managing stress and losing weight — can improve quality of life.

One way to prevent heart failure is to prevent and control conditions that cause heart failure, such as coronary artery disease, high blood pressure, diabetes or obesity.

Heart failure can be ongoing (chronic), or the condition may start suddenly (acute).

Heart failure signs and symptoms may include:

- Shortness of breath (dyspnoea) on exertion or lying down.
- Fatigue and weakness.
- Swelling (oedema) in the legs, ankles and feet.
- Rapid or irregular heartbeat.
- Reduced ability to exercise.
- Persistent cough or wheezing with white or pink blood-tinged phlegm.
- Increased need to urinate at night.
- Swelling of the abdomen (ascites).
- Very rapid weight gain from fluid retention.
- Difficulty concentrating or decreased alertness.
- Sudden, severe shortness of breath and coughing up pink, foamy mucus.
- Chest pain if the heart failure is caused by a heart attack.

Cause for alarm:

- Chest pain.
- Fainting or severe weakness.
- Rapid or irregular heartbeat associated with shortness of breath, chest pain or fainting.
- Sudden, severe shortness of breath and coughing up pink, foamy mucus.

• KIDNEY DAMAGE

Chronic kidney disease, also called chronic kidney failure, describes the gradual loss of kidney function. The kidneys filter wastes and excess fluids from the blood, which are then excreted in the urine. When chronic kidney disease reaches an advanced stage, dangerous levels of fluid, electrolytes and wastes can build up in the body.

In the early stages of chronic kidney disease, there may be few signs or symptoms. Chronic kidney disease may not become apparent until the kidney function is significantly impaired. Treatment for chronic kidney disease focuses on slowing the progression of the kidney damage, usually by controlling the underlying cause. Chronic kidney disease can progress to end-stage kidney failure, which is fatal without artificial filtering (dialysis) or a kidney transplant.

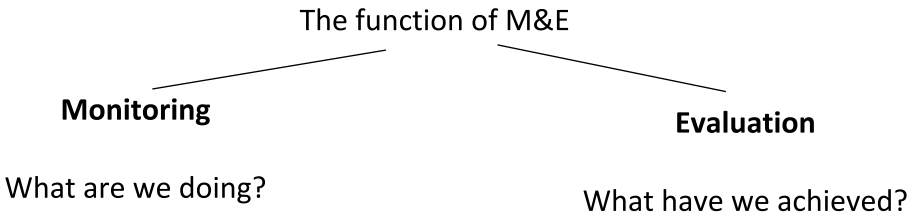
Signs and symptoms of chronic kidney disease develop over time if kidney damage progresses slowly. Signs and symptoms of kidney disease may include:

- Nausea
- Vomiting
- Loss of appetite
- Fatigue and weakness
- Sleep problems
- Changes in how much you urinate
- Decreased mental sharpness
- Muscle twitches and cramps
- Swelling of feet and ankles
- Persistent itching
- Chest pain, if fluid builds up around the lining of the heart
- Shortness of breath, if fluid builds up in the lungs
- High blood pressure (hypertension) that’s difficult to control

Signs and symptoms of kidney disease are often nonspecific, meaning they can also be caused by other illnesses. Because the kidneys are highly adaptable and able to compensate for lost function, signs and symptoms may not appear until irreversible damage has occurred.

14. SURVEILLANCE, MONITORING AND EVALUATION

Monitoring and evaluation (M&E) are an essential part of any program, large or small (61, 62).



The systematic **collection and analysis** of information as a project:

- Forms an integral part of day-to-day operational management to ***assess progress against objectives.***
- **Collects** good quality and comprehensive information for measuring and enhancing service delivery and health impact for a discreet population in a district.
- Aims at **improving the efficiency and effectiveness** of a project or organisation and is based on targets set and activities planned during the planning phases of work.
- Should be collected daily and analysed quarterly.

The basic questions that need to be asked regarding effective management of hypertension as a NCD are the following:

How is hypertension managed? Flow of patients in the facility, where BP is taken.
Patient care? Are guidelines and tools available?
Staff. Are staff trained and equipped to manage hypertension effectively?
Equipment. Are the following available: BP apparatus, Glucometer and test strips, scale, stadiometer, waist measuring tape, dipstix.

Laboratory services. Are they available, and what is the turnaround time for results?
Medicines. Are essential medicines available?
Records. How is the patient's progress recorded, are patient notes adequate?
Referral system. What nearest referral facility, ambulance and paramedical services are in place? (34)

In summary:
What works (what are the strengths?)
What doesn't work (what are the challenges)?
What should be done next?

All facility managers shall ensure that data collected by their respective facilities are reviewed during their monthly management meetings, and that remedial interventions are implemented to improve service delivery where the data shows inadequate performance.

Adherence to medication and follow up appointments forms an integral part of successful management of chronic conditions, including hypertension.

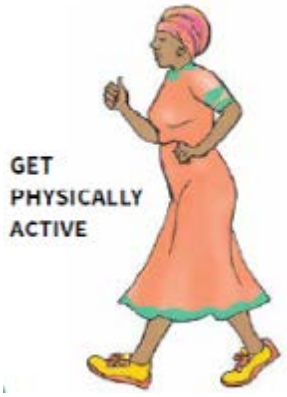
Adherence to appointments can be monitored as follows:

- Review all the daily appointment registers for three months.
- Tally the total number of patients booked.
- Calculate the number of patients and identify missing scheduled appointments.
- Conduct a survey on those patients missing scheduled appointment.
  The questionnaire for patient that missed their scheduled appointments may be accessed from the Ideal Clinic Monitoring System: Integrated Clinic services Management Manual.
  https://www.idealhealthfacility.org.za/
  https://www.idealhealthfacility.org.za/

This will assist to identify patients with uncontrolled hypertension.
Uncontrolled hypertension is defined as a patient that is a known hypertensive with a blood pressure of greater than 140/90 on in the last six months irrespective of cardiovascular risk factor status.

APPENDIX A: GET MORE ACTIVE

Decide to get more physical activity than you are getting now



1. Identify your convenient form of physical activity
Choose what kind of activity you enjoy (see the choices of physical activity below). Choose what kind of activity is convenient.

2. Get 150 minutes of physical activity throughout the week
Split it up over 7 days. Have one or two long sessions of physical activity per week and fill in the rest.

3. Sit less and break up your sitting time
Get up and move around at regular intervals during your day.

CHOOSE YOUR PHYSICAL ACTIVITY OPTION:

- **Walk** instead of taking transport OR Get off the bus / taxi / train one stop earlier and walk the rest of the way.
- Choose the **stairs** instead of lifts.
- **Play soccer** with the children instead of watching TV.
- Work in the garden, do housework or go for a walk instead of watching TV
- Instead of just visiting/having tea with a friend take a water bottle and go for a walk together.
- Walk to visit a friend instead of phoning them.
- Walk with your child to school.
- Take a short walk around the block, or up and down the road.
- Walk with the neighbourhood watch to feel safer.
- Choose a longer route to the place where you are going.
- Walk to the shop with your child, instead of sending them on their own.
- Walk somewhere during lunch time at work.
- Whenever you walk anywhere, walk as fast as you can.
- Carry your shopping bags, instead of using a trolley.
- Take fewer rest breaks and walk fast enough so that you are out of breath, your heart beats faster, and you are sweating.
- Start a walking group with other parents and grandparents in the area.
- Start an **exercise group** at your place of work or worship. or in your community: start with 2 or 3 people.
- Find/make some **steps** and step up and down for 1 minute at a time. At your own pace. Rest for one minute; then slowly increase the time. You spend stepping and decrease the rest periods in between
- **Dance** to your favourite song in your home.

APPENDIX B: HEALTHY EATING OPTIONS (62)

There is good food and food that is not good for you. Some food has parts that are good for you but also has parts that are not good for your health.

What are the main things we eat? These are protein, carbohydrates and fat.

PROTEIN

Makes building blocks for the body and helps you to grow.
E.g. meat, fish, chicken, eggs, beans, legumes, soya and nuts.

CARBOHYDRATES (CARBS)

Includes starchy food, sugar and fibre, and are used as fuel for your body.
E.g. bread, cereal, oats, maize meal, pasta, rice, potatoes, sweet potatoes.
Fruits and vegetables also contain carbohydrates.

FATS

Give the body energy
E.g. margarine, butter, oil
More healthy fats are found in nuts, vegetable oils, peanut butter and avocado.

VITAMINS AND MINERALS

Are chemicals that the body needs in small amounts to stay healthy
E.g. fruit and vegetables

What are refined Carbs?
Some carbohydrates are more processed/refined than others, and these are less healthy for the body since they contain less fibre.

Why is too much sugar a problem?

South Africa is 8th in the world for sugar consumption

The recommended amount of sugar needed per day is 6 teaspoons

Too much sugar in the diet (including what we drink) is linked to:

- Overweight and obesity
- Type 2 diabetes
- Diseases of the heart and blood vessels
- Some cancers
- Tooth decay

How can you cut down on sugar?

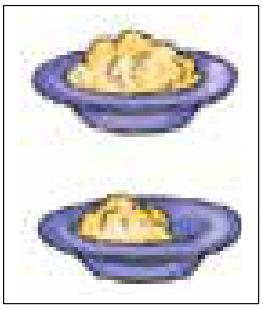
- Zero sugar drink or water instead of a can of cooldrink/bottle of fruit juice
- Less sugar in tea or coffee
- Less sugar on porridge

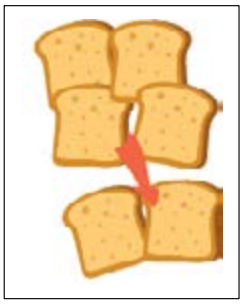
Less sweets and chocolates

Portion sizes

Which foods do we eat in large portions?

- ✓ Carbs/starch
- ✓ Unhealthy snacks e.g., chips





Essential messages to the patient

- ❖ Eat smaller portions.
- ❖ Eat less carbs.
- ❖ Cut out sugar wherever you can, especially fizzy drinks and sweets.
- ❖ Eat at least 5 fruit and/or vegetables daily.
- ❖ Eat healthy snacks.

APPENDIX C: REQUIRED BODY WEIGHT RANGE BY HEIGHT

BASED ON BMI (WEIGHT (KG) / HEIGHT IN M2) OF 18.5 AND 25

HEIGHT	NORMAL BODY WEIGHT RANGE	
(cm)	Lowest (kg)	Highest (kg)
200	74	100
199	73	99
198	73	98
197	72	97
196	71	96
195	70	95
194	70	94
193	69	93
192	68	92
191	67	91
190	67	90
189	66	89
188	65	88
187	65	87
186	64	86
185	63	86
184	63	85
183	62	84
182	61	83
181	61	82
180	60	81
179	59	78
178	59	79
177	58	78
176	57	77
175	57	77

HEIGHT	NORMAL BODY WEIGHT RANGE	
(cm)	Lowest (kg)	Highest (kg)
174	56	76
173	55	75
172	55	74
171	54	73
170	53	72
169	53	71
168	52	71
167	52	70
166	51	69
165	50	68
164	50	67
163	49	66
162	49	66
161	48	65
160	47	64
159	47	63
158	46	68
157	46	62
156	45	61
155	44	60
154	44	59
153	43	59
152	43	58
151	42	57
150	42	56

NORMAL BODY WEIGHT RANGE = BMI BETWEEN 18.5 & 25

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