

Community-based Hypertension Improvement Project (COMHIP)

Clinical Guidelines



09.2015

SUMMARY

- ☒ This clinical guideline on the management of Hypertension is intended to promote evidence-based management of hypertension in the community and thereby improve patient's clinical outcomes.
- ☒ The guideline is intended to assist Licensed Chemical Sellers (LCS), Community Health Officers (CHOs), Cardiovascular Disease (CVD) Nurses and Physicians in the screening and diagnosis of HTN, determination of appropriate treatment, and delivery of individualized pharmacological and non-drug interventions.
- ☒ This guideline is general for the ComHIP project and individualized guidelines have been developed for the various service delivery personnel matching their responsibilities.

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1.0 PROJECT DESCRIPTION

☒ The community-based Hypertension Improvement Project (ComHIP), aims to improve hypertension management and control in Ghana. The project will test a community-based model that engages the private sector and utilizes information and communication technologies (ICTs) to enhance the capacity of the Ghana Health Service and individuals to control hypertension. There are four (4) categories of personnel (Figure 1) involved in service delivery in ComHIP. These are;

- Community Health Officers
- Licensed Chemical Sellers
- Cardiovascular disease nurses
- Physicians

☒ Community Health Officers (CHOs) will screen community members; Licensed Chemical Sellers (LCS) will screen clients and contribute to management and follow up of hypersensitive clients; cardiovascular nurses (CVD nurses) will be responsible for confirming hypertension diagnosis, grading and management of clients with mild and forms of hypertension; Physicians will be responsible mainly for managing severe hypertensive clients.

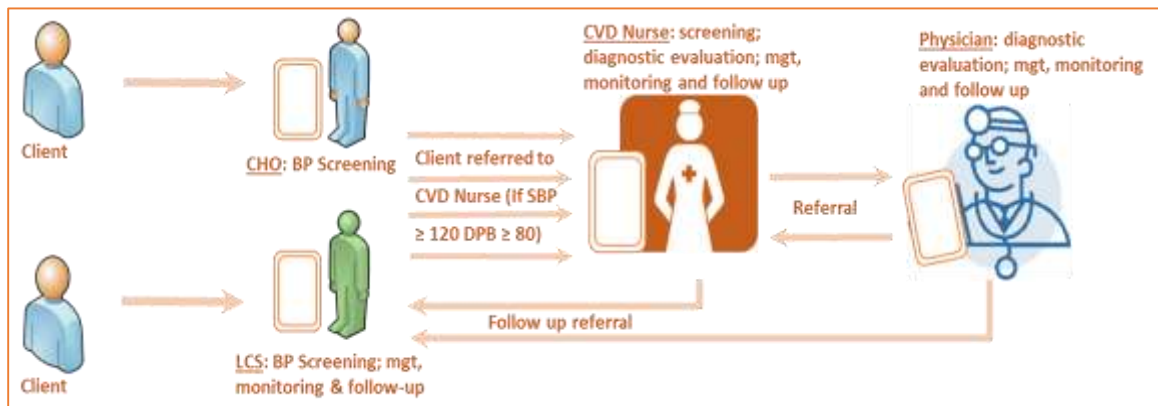


Figure 1: ComHIP Service delivery flow

☒ ComHIP involves the Ghana Health Service, FHI 360, London School of Hygiene and Tropical Medicine, University of Ghana School of Public Health, VOTO Mobile and with funding support from the Novartis Foundation. The project is for a period of 36 months.

2.0 SUMMARY OF PERSONNEL ROLE

☒ Table 1 summarizes the various functions of licensed chemical sellers (LCS), community health officers (CHOs), cardiovascular disease nurses and Physicians working in ComHIP.

Table 1: Summary of roles of various service delivery personnel

Phase	Activity	Community Health Officer	Licensed Chemical Seller	CVD Nurse	Physician
Phase 1: Screening	Community BP screening	Yes	Yes	No	No
	Screening referral	Yes	Yes	No	No
Phase 2: Diagnostic Evaluation	Confirmation of BP (HTN) diagnosis	No	No	Yes	Yes
	Staging of degree of HTN	No	No	Yes	Yes
	Assessment of other CVD risk factors	No	No	Yes	Yes
	Assessment of prevailing CVD symptoms	No	No	Yes	Yes
	Overall risk assessment/ Stratification	No	No	Yes	Yes
	Assessment of family history of CVD	No	No	Yes	Yes
	Laboratory investigation	No	No	Yes	Yes
	Assessment of target organ complication	No	No	Yes	Yes
	Assessment of Lifestyle Issues	No	No	Yes	Yes
	Diagnostic referral	No	No	Yes	No
Phase 3: Management, Monitoring & Follow Up	Baseline Anthropometry	No	No	Yes	Yes
	Recommendation for drug treatment	No	No	Yes	Yes
	Medication Dispensing	No	Yes	No	No
	Recommendation for Non-drug treatment	Yes	Yes	Yes	Yes
	Evaluation of drug side effects	No	Yes	Yes	Yes
	Monitoring of BP response to treatment	No	Yes	Yes	Yes
	Adherence Counselling	No	Yes	Yes	Yes
	Anthropometric monitoring	No	No	Yes	Yes
	Regular follow up and interaction	No	No	Yes	No
Management referral	No	No	Yes	Yes*	

*In rare instances, certain patients may be referred by the Physician to a hypertension specialist

3.0 SCREENING

3.1 Hypertension Definition and Classification

Hypertension is used to refer to the level of blood pressure (BP) above which treatment does more good than harm. Numerically, hypertension is defined as a systolic blood pressure (SBP) ≥ 140 mmHg or a diastolic blood pressure (DBP) of ≥ 90 mmHg. The following BP classification has been adopted;

Table 2: Classification of blood pressure for adults aged ≥ 18 years

BP Classification	Systolic BP (mmHg)		Diastolic BP (mmHg)
Normal	<120	and	<80
Pre-Hypertension*	120-139	or	80-89
Grade 1 Hypertension (Mild)	140-159	or	90-99
Grade 2 Hypertension (Moderate)	160-179	or	100-109
Grade 3 Hypertension (Severe)	≥ 180	or	≥ 110

*Pre-hypertension: This refers to patients with very real risk of developing chronic high blood pressure

3.2 BP Screening Protocol

- A. Who should conduct screening?** LCS, Community Health Officer (CHO)
- B. Who is Eligible to be screened?** Any adult in the community 18 years and older excluding pregnant women.
- C. Where can Screening be done?** LCS will conduct screening at their shops. CHOs will conduct screening at CHPS compounds and during outreach/home visits.
- D. How should BP be measured?** All personnel involved in ComHIP should adopt simple techniques that minimize BP measurement errors: The following are recommended;
 - i. Ensure a quiet environment
 - ii. Patient must be rested for at least 5 minutes, quiet and comfortable.
 - iii. Patient must be seated with arm at heart level and feet flat on the floor
 - iv. Ensure that sleeves are rolled up or any tight clothing removed.
 - v. Ensure that the individual has not exercised, smoked or consumed foods, alcohol or drinks containing caffeine (such as tea or coffee) at least 30 minutes before measurements
 - vi. Ensure that client is not acutely ill or injured
 - vii. Use appropriate size cuff (E.g. too small a cuff can raise BP)
 - viii. Measure BP in both arms at first; then subsequently only measure in the arm which gave the higher reading.
 - ix. Each time BP is to be measured, 3 readings must be taken at least 3 minutes apart.
 - x. Refer to BP measurement guide whenever unsure.
- E. What to do with BP reading?**
 - I. All clients with BP $\geq 140/90$ mmHg must be referred to CVD nurse. Clients with BP in the Pre-hypertension range must be counselled on lifestyle and encourage to check BP regularly.
 - II. For clients with BP $\geq 180/110$ stress the need for urgent/immediate visit to a CVD nurse and arrange this visit with the CVD nurse.

⊗ Remember to explain to client that Screening is not diagnosis. Further investigation would be needed even if you suspect that the high BP may be hypertension.

4.0 DIAGNOSIS AND EVALUATION

4.1 Objectives of diagnostic evaluation

There are four key objectives in the assessment of a person with suspected hypertension are;

- 1) To confirm whether or not blood pressure is elevated
- 2) To document the presence or absence of blood pressure related target organ damage (e.g. left ventricular hypertrophy, hypertensive retinopathy, increased albumin: creatinine ratio);
- 3) To evaluate the person's cardiovascular risk either due to established cardiovascular disease or high cardiovascular disease risk states (e.g. diabetes or CKD), or by calculation of their 10 year CVD risk estimate
- 4) To consider whether there may be secondary causes for the hypertension.

4.2 Confirmation of hypertension diagnosis

- A. Who should confirm HTN diagnosis?** For most cases CVD nurse would confirm hypertension status and grade severity. In few instances, Physicians would do this for referred clients.
- B. How should BP (HTN) be confirmed?** The Following steps are recommended Use two measurements obtained two weeks apart.
- i. At each visit, take 3 BP readings and record the mean
 - ii. Systolic equal or greater than 140 and or diastolic equal or greater than 90 (use mean of the readings obtained at the three separate visits)
 - iii. For clients with initial BP in grade 3, CVD nurse must provide immediate starting dose and refer to physician

4.3 Grading of the Severity of Hypertension

- A. Who should grade severity of hypertension? Usually** CVD nurse will be responsible for grading patients, Physicians will confirm severe hypertension grade.
- B. How should HTN severity be graded?** Use [Table 2 \(page 6\)](#) to grade level of severity.
- C. Are there any referrals needed?**
- I. YES, CVD nurse must refer all patients with severe hypertension to a Physician.
- ☒ All confirmed patients 18-30yrs must be referred for further investigation by a physician to rule out possible secondary causes.

4.4 Assessment for other CVD risk factors

- A. Who should conduct assessment of CVD risk factors?** CVD nurse, Physician
- B. How should CVD risk factors be assessed?** A set of questions are useful in assessing CVD risk factors. Usually a Yes or No response is required from clients by asking the following;
- i. Have you had prior history of diabetes or hypertension?
 - ii. Have you had prior history of elevated serum lipids
 - iii. Do you currently smoke tobacco on a daily basis, less than daily, or not at all?
 - iv. In a typical week, how many minutes do you spend engaging in vigorous/high intensity physical work, activities or exercises?
 - v. Do you drink alcohol?
 - vi. Have you had prior history of high cholesterol

4.5 Assessment for Target Organ Damage or CVD Event

- A. Who should conduct assessment for TOD/CVD events?** CVD nurse, Physician
- B. How should TOD/CVD event assessment be done?** A yes or No responses are usually needed from patients upon asking the following questions;
- i. Have you had prior history of heart failure
 - ii. Have you had prior history of heart attack
 - iii. Have you had prior history of a stroke or Transient Ischemic Attack (Mini stroke)
 - iv. Have you had prior history of kidney failure or disease

4.6 Assessment of Family History

- A. Who should conduct assessment of family history?** CVD nurse, Physician
- B. How should family history assessment be done?** Enquire from patient about history of any CVD event (stroke, heart attack) in parents and siblings; especially at age of less than 50.

4.7 Assessment of ongoing CVD symptoms

- A. Who should conduct assessment of prevailing CVD symptoms?** CVD nurse, Physician
- B. How should ongoing CVD symptoms be assessed?** Enquire from patient to obtain a Yes or No answer using set of questions below;
- i. Ask about exertional dyspnea or at rest
 - ii. Ask about sleep disturbance by shortness of breath
 - iii. Ask about sleeping with more pillows of preference to sleep in a chair
 - iv. Ask about cough or wheezing during sleep.
 - v. Ask about excessive tiredness.
 - vi. Ask about central severe chest pain that disables the patient.
 - vii. Ask about feeling weak or wanting to faint
 - viii. Ask about palpitations
 - ix. Ask about loss of consciousness, vision, or speech.
 - x. Ask about weakness or numbness of one side of the body.
 - xi. Ask about swelling of feet and legs.

4.8 Anthropometric assessment

- A. Who should conduct anthropometric measurements?** CVD nurse, Physician
- B. What anthropometric measurements should be assessed?** Weight, Height, Waist Girth. Calculate BMI
- C. When should measurements be taken?** Obtain accurate measurements during enrollment, thereafter every three months.
- D. How should anthropometric measurements be conducted?** Follow recommended techniques below for each assessment;

4.81 Weight

This should be measured using a weighing scale. Follow the following steps;

- I. Before each measurement, make sure the scale is zero
- II. Ask the patient to remove heavy outer clothing (e.g. coats, jackets, shoes etc.)
- III. Ask the patient to stand motionless in the middle of the scale platform with the feet slightly apart and the body weight distributed equally on both feet.
- IV. Record body mass to nearest 0.1 Kg
- V. Ask patient to step off scale

- VI. Repeat steps
- VII. If the 2 measurements differ by more than 0.4 kg then repeat steps one more
- VIII. If two measurement record the average value. If three measurements record the median value.
- IX. Refer to Weight measurement guide

4.82 Height

This should be measured using a Stadiometer. Follow the following steps;

- Ask the subject to stand on the centre of the base with their back to the stadiometer
- Ask them to put their feet together and move back until their heels touch the bottom of the stadiometer upright.
- Their buttocks and upper part of their back should also be touching the stadiometer upright. Their head does not have to touch the stadiometer.
- The respondent's head should be in the Frankfort plane.
- This is achieved when the lower edge of the eye socket (the Orbitale) is horizontal with the Tragon [see appendix 5.5].
- The vertex will be the highest point on their head. If their head is not aligned properly, (and for most respondents it probably won't be), ask them to raise or lower their chin until it is in the Frankfort Plane.
- When you are happy that the respondent is in the correct position, ask them to take a deep breath and hold it.
- Lower the headboard until it is in contact with the head. Compress the hair if needed. Make sure you don't bend the headboard from the horizontal, nor move the respondent's head.
- Hold the headboard firmly at its final position and take the reading to the nearest 0.1 cm.
- When you have completed the reading, ask the respondent to step away from the stadiometer.
- Record measurements immediately.
- Refer to height measurement guide for more details

4.83 Waist Circumference

This should be measured using a tape measure. Follow the following steps;

- Ask the patient to place himself in the following manner: Clear the abdominal region, Feet shoulder-width apart, Arms crossed over the chest
- It is suggested to kneel down to the right of the patient in order to measure waist girth; palpate the patient's hips to locate the top of the iliac crest and Draw a horizontal line halfway between the patient's back and abdomen.
- Place the measuring tape horizontally around the patient's abdomen. To work comfortably, it is suggested to wrap the tape around the patient's legs and then move it up.
- Align the bottom edge of the tape with your marked point. Gently tighten the tape around the patient's abdomen without depressing the skin.
- It is suggested to request the patient to relax and breathe normally (abdominal muscles should not be contracted). Ask the patient to take 2 or 3 normal breaths. Measure from the zero line of the tape (to the nearest millimetre) at the end of a normal expiration

4.9 Assessment for signs of CVD

A. Who should conduct assessment for signs of CVD? CVD nurse, Physician

B. How should assessment for signs of CVD be conducted?

- i. Note a significant difference (>15mmHg) systolic BP in the arms (Nurse & Physician)
- ii. Listen to the neck for bruits (Physician)
- iii. Feel for irregularity of the radial pulse; also for rates greater than 100bpm. (Nurse & Physician)
- iv. Check for displacement of the apex beat. (Physician)
- v. Listen to the heart for normal and abnormal sounds (Physician)
- vi. Listen to the back of the chest for Crepitation (Physician)
- vii. Look and feel for swelling of the legs and feet (Nurse & Physician)

4.10 Risk stratification

A. Who should conduct overall risk assessment/stratification? CVD nurse, Physician

B. What are the general considerations to grade overall risk? Make consideration of the following in grading overall patient risk.

- i. Consider the severity of the hypertension (Refer to table 3 below)
- ii. Consider the other CVD risk factors of the patient
- iii. Consider any target organ damage*

Table 3: Grading of blood pressure values

BP ranges	Pre-Hypertension		Grade 1	Grade 2	Grade 3
	Normal	High normal	SPB 140–159	SPB 160–179	SBP ≥180
SPB 120–129	SPB 130–139	DPB 90–99	DBP 100–109	DBP ≥110	
DBP 80–84	DPB 85–89				

⊗ Risk Factors

The following risk factors are included in the risk stratification.

- Men aged >55 years
- Women aged >65 years
- Smoking
- Dyslipidemia
- Family history of premature cardiovascular disease (men aged <55 years, women aged <65 years)
- Abdominal obesity (abdominal circumference ≥102 cm for men, ≥88 cm for women)

⊗ Comorbidities

The following conditions are included where possible in the overall risk assessment;

- Cerebrovascular disease (TIA, stroke) (Nurse & Physician)
- Heart disease (angina, myocardial infarction, heart failure) (Nurse & Physician)
- Chronic renal disease (Nurse & Physician)
- Peripheral vascular disease (Physician)
- Diabetes (Nurse, Physician)

Table 4: CVD Risk stratification for patients

High Risk	<ul style="list-style-type: none"> • Grade 3 BP, with or without TOD, risk factors and Comorbidities • Grade 2 BP with TOD and/or +2 risk factors
Moderate risk	<ul style="list-style-type: none"> • Grade 2 BP without TOD, >2 risk factor or comorbidities • Grade 1 with TOD and/or >2 risk factors, comorbidities
Low risk	<ul style="list-style-type: none"> • Grade1 BP with no TOD, risk factors or co-morbidities

***TOD** is used to refer to damage occurring in major organs fed by the circulatory system (heart, kidneys, brain, eyes) which can sustain damage due to uncontrolled hypertension. TOD will be assessed by history, physical examination and laboratory investigation. However, TOD will mainly be clinically determined as this will be the usual or expected level of care in the study area. Specific TODs will be assessed as below;

a) Heart Failure criteria for assessment;

- paroxysmal nocturnal dyspnea
- orthopnea
- nocturnal cough or wheezing
- sinus tachycardia
- leg and pedal edema
- Objective tests : ECG evidence of left ventricular hypertrophy (LVH)

b) Kidney damage:

- To be assessed with tests- proteinuria and serum creatinine or prior diagnosis of same. Subjective symptoms: Polyuria, nocturia, haematuria

c) Brain damage:

- To be clinically assessed- symptoms of stroke or prior documentation of a stroke.

d) Eye damage

- Examine the fundi for the presence of hypertensive retinopathy. Subjective signs: impaired vision

4.11 Laboratory Investigations

A. Who can order for laboratory investigation? CVD nurse, Physician

B. What laboratory investigations are recommended?

- Physician should prioritize the following investigations;
 - I. Complete blood count
 - II. Fasting sugar, HbA1c, and lipids
 - III. Urinalysis
 - IV. Renal profile.
 - V. Electrocardiogram (ECG)
- CVD nurse should prioritize the following investigations;
 - I. ECG
 - II. Fasting blood sugar

C. Laboratory prioritization for different risk profiles

- Low Risk: ECG (Nurse)
- Moderate risk: Glucometer FBS, ECG (Nurse)
- High risk: Full range (Physician)

5.0 MANAGEMENT, MONITORING AND FOLLOW UP

5.1 BP Treatment Goal

- A. Who should outline BP treatment goal?** CVD nurse, Physician
- B. What BP treatment goal should be set for a patient?** The goal of treatment is to bring all patients to below 140/90mmHg

5.2 Recommendations for Non-drug Treatment

- A. Who should make recommendations for non-drug treatment?** CVD nurse and Physicians should make recommendations, LCS should reinforce such recommendations
- B. Who are the candidates for non-drug treatment?** Non-drug measures should be recommended for all clients diagnosed as pre-hypertensive and hypertensive.
- C. What non-drug approaches should be recommended?** Prioritize the following;
 - i. Maintenance of Ideal body Weight
 - ii. Healthy low salt and Low fat diet
 - iii. Increased fruit and vegetable consumption
 - iv. No more than two drinks a day
 - v. No smoking
 - vi. Regular aerobic exercise; simple daily brisk walk for thirty minutes
 - vii. Adequate management of stress and anxiety levels

5.3 Recommendation for drug treatment

- A. Who should make recommendations for drug treatment?** CVD nurse, Physician
- B. Which clients are candidates for drug therapy?** All enrolled clients (BP \geq 140/90mmHg) are candidates for drug therapy supplemented with lifestyle modification irrespective of risk level.
- C. Should treatment be initiated with monotherapy or multiple drugs?** The decision to begin with a single or dual drugs rests principally on the level at which the clients BP is above goal and on patients overall risk profile. Typically;
 - i. Begin with a SINGLE drug if BP <20/10mmHg above goal and in low risk patients.
 - ii. Begin with TWO drugs if BP >20/10mmHg above goal and in moderate and high risk patients.

5.4 Types of Antihypertensive drugs

- A. What are the main drugs that can be prescribed?** Four (4) drugs are recommended to CVD nurses for starting treatment in eligible patients in the ComHIP study. Physicians will have wider options to address complex patients' needs. The recommended drugs are;
 - I. Diuretic: Bendroflumethiazide. -initial dose, 2.5mg daily. Maximum dose of 5mg daily.
 - II. Beta-blocker: Atenolol-initial dose of 50mg daily. Maximum dose of 100mg daily provided the heart rate is greater than 60/min on the lower dose.
 - III. Calcium channel blocker: Nifedipine retarde or XL -initial dose 30mg daily. Maximum dose of 60 to 90 mg daily.
 - IV. ACE Inhibitor: Lisinopril-initial dose of 20mg daily. Maximum dose of 30mg daily.

5.5 Titration of antihypertensive medications (CVD Nurses): Low and Moderate risk patients

- ⊗ The following steps should guide CVD nurses in the dose titration of hypertensive medications;

A. Patients with a difference between enrollment and goal BP that is less than 20/10mmHg

- Start with only bendrofluomethiazide. (See Appendix 7.2)
 - Add atenolol or nifedipine or Lisinopril if BP is greater than goal of 140/90 after three months of bendrofluomethiazide.
 - Wait for three more months and if BP is still greater than 140/90, increase the dosage of the atenolol or nifedipine or Lisinopril.
 - Wait for another three months and refer patient to a physician if BP is still greater than 140/90
- ⊗ Key point: For clients with BP < 20/10 above goal, typically they will undergo 9 months of therapy after which failure to attain BP goal will call for referral to a physician at hospital. However, referral may be made anytime if any complication or serious adverse effects occur within this 9-month period. Patient monitoring should be done every 6 weeks irrespective of whether change in therapy or not.

B. Patients with a difference between enrollment and goal BP that is greater than 20/10

- Start with bendro AND atenolol or nifedipine or Lisinopril
 - After three months if BP is greater than 140/90, increase the dosage of the atenolol or nifedipine or Lisinopril.
 - If BP remains greater than 140/90 three months later, then refer to physician.
- ⊗ Key point: For clients with BP ≥ 20/10 above goal, typically they will undergo 6 months of therapy after which failure to attain BP goal will call for referral to a physician at hospital. However, referral may be made anytime if any complication or serious adverse effects occur within this 9-month period. Patient monitoring should be done every 6 weeks irrespective of whether change in therapy or not.

5.6 Titration of antihypertensive medications (Physicians): High risk patients

- ⊗ The following steps should guide physicians in the selection and dose titration of hypertensive medications.

A. What drugs are available to physicians? All the classes of antihypertensive below;

- Diuretic: bendroflumethiazide.-2.5mg daily
 - Calcium Channel Blocker (CCB): Amlodipine 5-10mg or Nifedipine (SR) 20-60mg daily
 - Beta Blocker: Atenolol 50-100mg daily
 - Angiotensin Converting Enzyme (ACE) Inhibitor: Lisinopril 10-30mg daily
 - ARB: Losartan 50-100mg daily
- ⊗ Additional options like centrally acting agents, alpha blockers, aldosterone antagonist may be available to physicians

B. What are the acceptable and possible combinations? The possible combinations are

- a+b; a+c; a+d; a+e; b+d; b+c; b+e
- The choice may be influenced by the presence of the patient's other medical conditions
 - Titrate dose or add additional drug to lower the BP to goal.

C. Recommendations for compelling indications

There is evidence to support the use or avoidance of certain antihypertensive when other conditions are present. These include the following;

Table 5: Compelling indications for individual drug classes

compelling indications	initial therapy options
Heart Failure	THIAZ, BB, ACEI, ARB, ALDO ANT
Post Myocardial Infarction	BB, ACEI, ALDO ANT
High CVD risk	THIAZ, BB, ACEI, CCB
Diabetes	THIAZ, BB, ACEI, ARB, CCB
Chronic Kidney Disease	ACEI, ARB
Recurrent Stroke Prevention	THIAZ,ACEI

Keys: THIAZ=thiazide diuretic, ACEI=angiotensin converting enzyme inhibitors, ARB=angiotensin receptor blocker, BB=Beta-blocker, CCB=calcium channel blocker, ALDO ANT=aldosterone antagonist

5.7 General Prescribing Guideline

- A. Who should prescribe antihypertensive medicines?** CVD Nurse, Physician
- B.** Before prescribing medicines confirm that patient agrees to be on medications
- C. How should prescriptions be written?** Follow the steps below;
 - i. written legibly in ink or otherwise so as to be indelible
 - ii. written by the prescriber (CVD Nurse, Physician) and not left for someone to complete
 - iii. should be dated
 - iv. The full name and address of the patient should be stated
 - v. Dosage form, generic name of medication, strength, dose and dosage schedule
 - vi. Exact quantity of medication to be supplied
 - vii. the signature of the prescriber(CVD nurse, Physician) (which should be in ink)

5.8 Side Effect Monitoring

- A. Who should monitor side effects in patients?** CVD nurse, LCS, Physician
- B. What are the possible side effects of various medicines?** See below;
 - i. ACE Inhibitors: swelling of lips, tongue and throat; the patient must be advised to seek immediate medical help. They can cause irritating dry cough.
 - ii. Beta blockers: worsening or precipitation of asthma; bradycardia; worsening of HF
 - iii. Calcium channel blockers: edema of the feet
 - iv. Diuretic: low potassium leading to generalized weakness.

5.9 monitoring of response to treatment

- A. Who should monitor clients' response to treatment?** CVD nurse, Physician, LCS
- B. What should be the monitoring priorities?** see key focus below
 - i. Aim for goal BP reading
 - ii. Monitor for side effects
 - iii. Check for adherence to the non-drug measures for BP control
 - iv. For resistant hypertension consider evaluation for interfering substances
 - v. Also consider specialty consultation for patients with resistant hypertension.

5.10 General dispensing Guideline (For LCS only)

A. Who should dispense medication? LCS

B. What checks should be done before dispensing medicines? LCS should ensure that;

- i. the prescription is legally valid, genuine and has not been altered after issuing
- ii. Each medicine on the prescription contain the dosage form, generic name, strength, dose, dosage schedule and quantity of medication to be supplied
- iii. The prescription is assessed for validity, safety and clinical appropriateness.

C. How should medicines be labelled? Each dispensed medication should be appropriately packaged and adequately labelled with the following minimum information:

- i. Name of the patient and the generic name of the medicine
- ii. Strength of the active ingredient and special instructions
- iii. Quantity of dispensed product
- iv. Complete dose regimen in written and/or graphic form
- v. Duration of use
- vi. Name and address of the LCS facility and dispenser
- vii. Date of dispensing

- ☒ Dispenser should always ensure that patient fully understands how the medication should be taken before leaving premises.

5.11 Hypertensive Emergencies

- ☒ Severe hypertension, usually BP > 180/110 mmHg in adults may be associated with acute neurological, cardiovascular or renal compromise, and could be fatal.
- If an LCS or CHO records BP reading for a client in this range, arrangements must be made immediately to see a CVD nurse must immediately administer oral hydralazine 10mg and refer to a physician. Arrange with the physician for the patient's visit
 - Physician to administer hydralazine IV 5-10 mg slowly over 20 minutes. This dose may be repeated after 20-30 minutes, until the patient is conscious and can take oral medications.

5.12 Referral SOP for CVD nurse

A. Mild/Moderate risk Patients

- All confirmed hypertensive clients' 18-30 years should be referred to a physician for further investigation.
- All clients with suspected secondary causes should be referred to a Physician
- All mild and moderate hypertensive clients with no change in BP levels within the first 90 days (resistant hypertension) of treatment should be referred to a physician.
- Clients who have developed intolerable side effects should be referred
- All clients who develop hypertension-related complication should be referred to a physician
- All clients who show signs of target organ damage while under treatment should be referred to a physician.
- Any client who experiences a cardiovascular event while under treatment should be referred to a physician

B. High risk Patients

- All severe/high risk patients should be referred to a physician
- All clients with history of unstable stroke or cardiovascular event should be referred to a physician

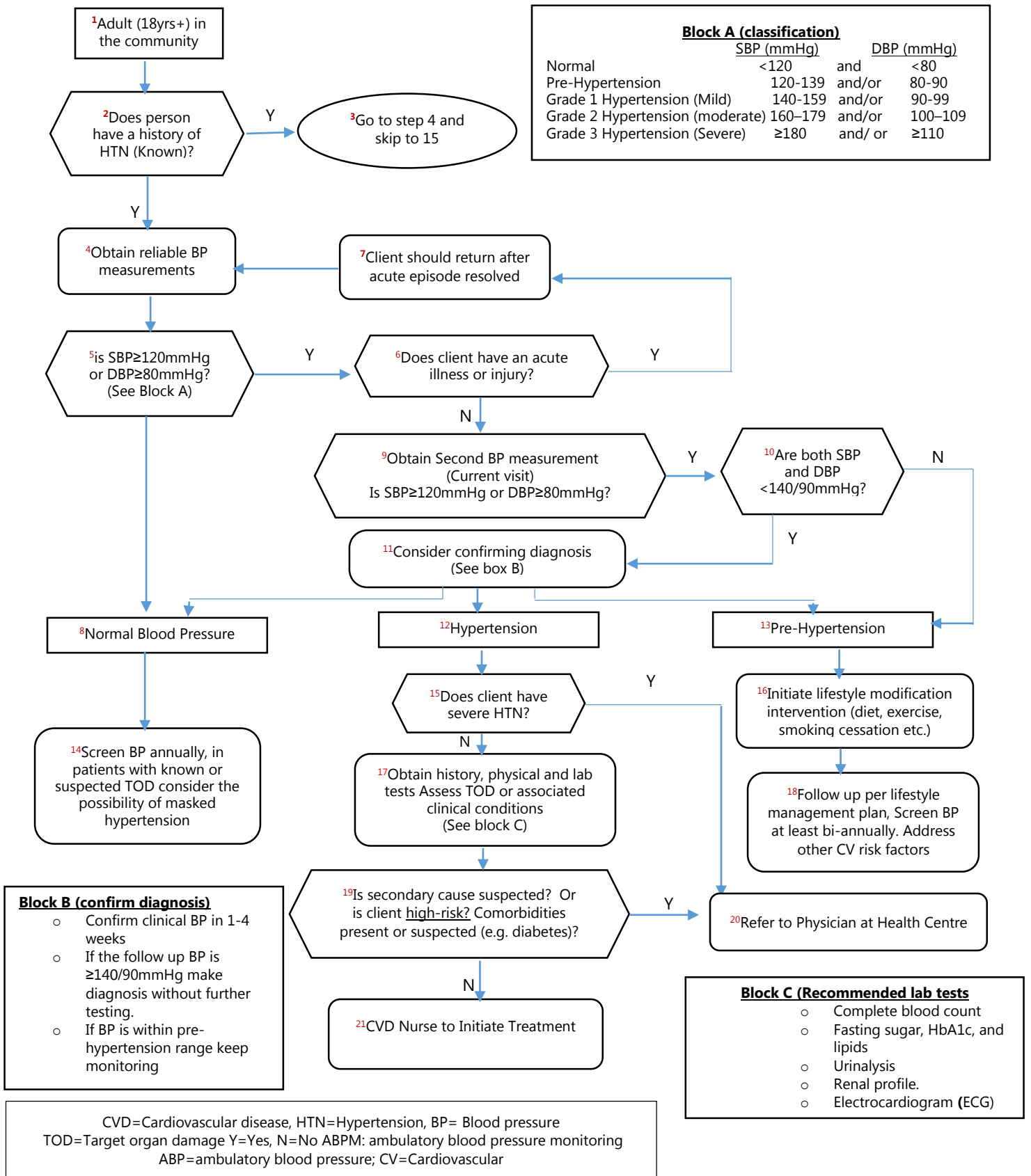
5.13 Proposed activities for patients' visit

The following is aimed at helping CVD nurses determine what needs to be done at a patients visit.

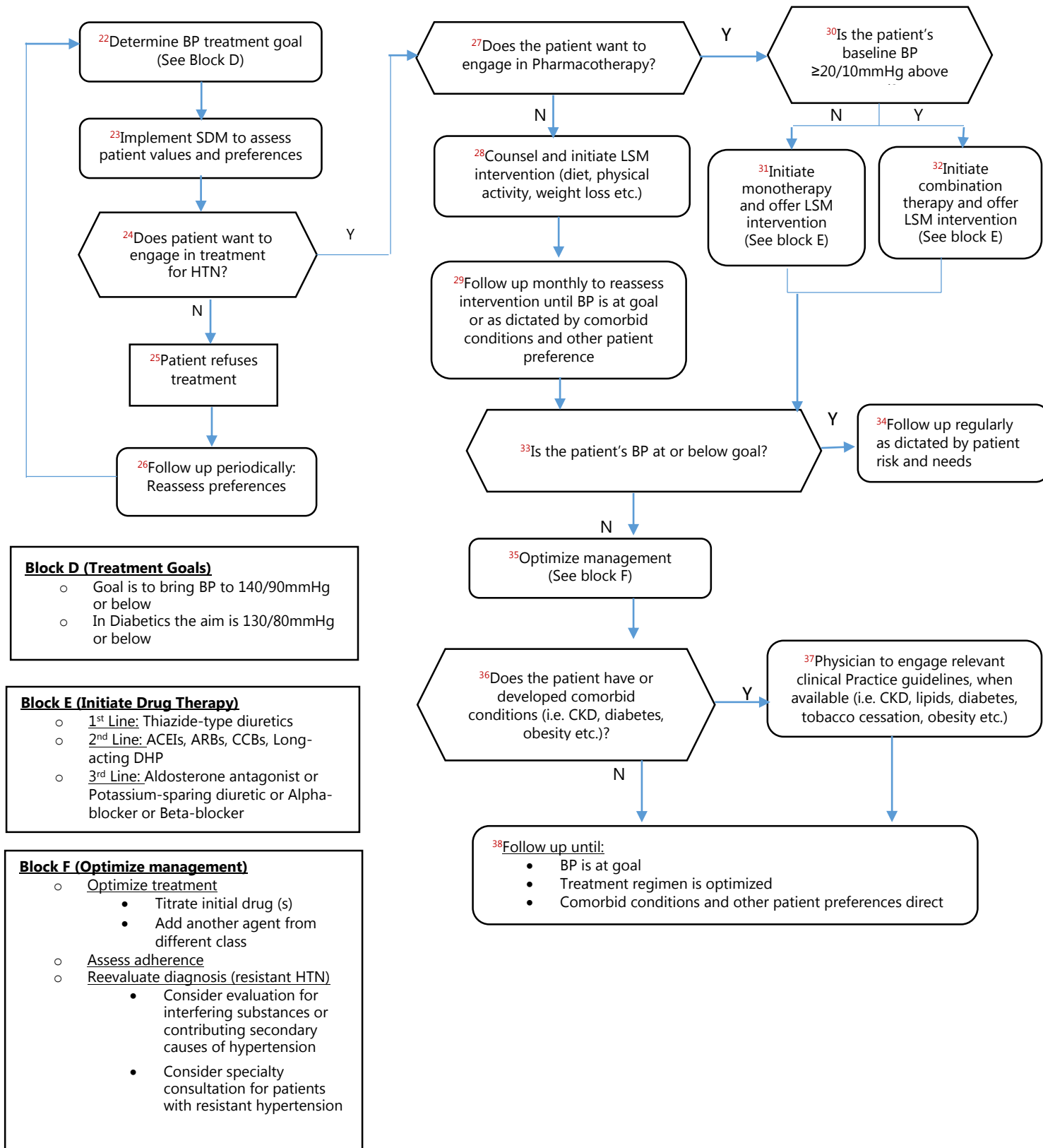
Table 6: Patient Visits and proposed activities

Visit Number	When	Activity
1	After patient has been screened and referred by LCS, CHO	CVD Nurse to recheck BP
2	Two weeks after visit 1	<ol style="list-style-type: none"> 1. CVD Nurse to recheck BP and confirm diagnosis 2. Enroll patient, perform risk assessment, perform anthropometric measurements 3. Refer to Referral SOP for CVD nurse for all patients that should be referred to Physician. 4. Initiate treatment 5. Order laboratory investigation as needed 6. Perform Hypertension counseling
3	6 weeks after visit 2	<ol style="list-style-type: none"> 1. Re-check BP 2. Assess treatment, perform counseling
4	6 weeks after visit 3	<ol style="list-style-type: none"> 1. Review treatment plan until goal is reached 2. Perform anthropometric measurements every 3 months after enrollment
5 & subsequent visits	<ul style="list-style-type: none"> • Every 3 months for patients with Mild Hypertension (treated by CVD nurse) • Every 2 months for patient with Moderate Hypertension (treated by CVD nurse) • Monthly for Patients with High (treated by Physicians only) 	<ol style="list-style-type: none"> 1. Re-check BP, review treatment, assess for risk factors, perform Hypertension counseling 2. Conduct follow up assessment every 6 months after enrollment

6.0 SCREENING AND DIAGNOSIS ALGORITHM



7.0 MANAGEMENT FLOW ALGORITHM



7.0 APPENDIX

7.1 Summary of GHS and NHIA approved drugs

Class	Medicine	Recommended in GHS treatment guideline	Available on NHIS Medicines List	Reimbursement NHIA cost (GHC)
Diuretics	Bendroflumethiazide 2.5mg	Yes	Yes	0.06/tab
	Bendroflumethiazide 5mg	No	Yes	0.06/tab
	Spironolactone 25mg	No	Yes	0.40/tab
	Spironolactone 50mg	No	Yes	0.70/tab
Beta-Blockers	Atenolol 25mg	Yes	Yes	0.10/tab
	Atenolol 50mg	Yes	Yes	0.10/tab
	Atenolol 100mg	Yes	Yes	0.13/tab
	Bisoprolol	Yes	No	n.a
	Carvedilol	Yes	No	n.a
ACE inhibitors	Lisinopril 2.5mg	Yes	Yes	0.18/tab
	Lisinopril 5mg	Yes	Yes	0.20/tab
	Lisinopril 10mg	Yes	Yes	0.25/tab
	Lisinopril 20mg	Yes	Yes	0.30/tab
	Ramipril 2.5mg	Yes	Yes	0.22/tab
	Ramipril 5mg	Yes	Yes	0.40/tab
ARBs	Losartan 25mg	Yes	Yes	0.36/tab
	Losartan 50mg	Yes	Yes	0.50/tab
	Losartan 100mg	Yes	Yes	1.0/tab
	Candesartan	Yes	No	n.a
	Valsartan	Yes	No	n.a
Calcium Channel Blockers	Nifedipine 10mg (capsule)	No	Yes	0.35/cap
	Nifedipine 10mg (SR)	Yes	Yes	0.21/tab
	Nifedipine 20mg (SR)	Yes	Yes	0.17/tab
	Nifedipine 30mg XL (GITS)	Yes	Yes	0.47/tab
	Amlodipine 5mg	Yes	Yes	0.20/tab
	Amlodipine 10mg	Yes	Yes	0.30/tab
Alpha Blockers	Prazosin 500mcg	Yes	Yes	0.60/tab
Centrally acting agents	Methyl dopa 250mg	Yes	Yes	0.25/tab
Vasodilators	Hydralazine 25mg	Yes	Yes	0.70/tab
Combination therapies	Atenolol + Hydrochlorothiazide (50+25mg)	No	Yes	1.00/tab
	Atenolol + Hydrochlorothiazide (100mg +25mg)	No	Yes	2.10/tab
	Lisinopril + Hydrochlorothiazide (10mg+12.5mg)	No	Yes	1.00/tab
	Lisinopril + Hydrochlorothiazide (20mg+12.5mg)	No	Yes	2.05/tab

7.2 Drug Management Flow diagram for CVD nurses

