MINISTRY OF HEALTH
REPUBLIC OF GHANA

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TRAINING MANUAL FOR THE MANAGEMENT OF CARDIOVASCULAR DISEASES

NURSES

First Edition | 2021

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NURSES

PREFACE

Cardiovascular diseases (CVDs) are a growing public health problem in Ghana and other countries in Sub-Saharan Africa. Deaths from non-communicable diseases have increased by 55% from 2000 to 2016. CVDs are one of the top two causes of mortality in Ghana: accounting for more institutional deaths than malaria in 2008.

According to the Global Burden of Disease Study (GBD), ischaemic heart disease was the fourth leading cause of death in Ghana in 2016. The prevalence of hypertension, a major risk factor for CVDs, is increasing rapidly and ranges from 19% to 48% in the adult population according to the Ghana Health Service Annual Report, 2017. This is due to rising life expectancy and change of lifestyle contributing to increased prevalence of predisposing factors for hypertension. Early diagnosis and adequate management of risk factors can prevent the development of CVDs and their fatal consequences.

To improve the risk assessment, prevention and management of CVDs at all levels of care, the Ministry of Health, Ghana has developed *'National Guidelines for the Management of Cardiovascular Diseases'* with the participation of all relevant stakeholders and it reflects internationally approved management pathways for CVDs. They serve as a practical guide for assessing risks and, preventing and managing the most important CVDs prevalent in Ghana and can be used at all levels of care.

To ensure the effective use of these Guidelines, trainings have to be carried out. This training manual should guide the facilitators of the trainings and be used hand in hand with the *'National Guidelines for the Management of Cardiovascular Diseases'*.

This manual includes 11 modules, each with defined objectives and teaching materials. Different learning methods are suggested for each module to make the training interesting and the learning as easy as possible.

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CONTENT

LIST OF ABBREVIATIONS

AED	Automated external defibrillator
CAD	Coronary artery disease
CHPS	Community-based Health Planning and Services
CPD	Continuous professional development
CPR	Cardiopulmonary resuscitation
CVD	Cardiovascular disease
DVT	Deep vein thrombosis
ECG	Electrocardiogram
HF	Heart failure
ISH	International Society of Hypertension
NCDs	Non-communicable diseases
NYHA	New York Heart Association
OPD	Out Patients Department
PE	Pulmonary Embolism
WHO	World Health Organisation

LIST OF TABLES

INTRODUCTION

OVERVIEW OF TRAINING COURSE

RATIONALE

This training course has been developed to address an important need in Ghana – to improve the knowledge and practices related to the identification, diagnosis and management of cardiovascular diseases among practicing health workers at all levels within the health system. It is based on the *National Guidelines for the Management of Cardiovascular Diseases* and supports its implementation.

The training course includes a Facilitator's Guide with 11 modules and Training Slides and is designed as a tool for facilitators, to help them prepare and deliver the training. It is meant as guidance, not as a rule. The training manual should be used hand in hand with the *National Guidelines for the Management of Cardiovascular Diseases'*in Ghana.

CVDs account for more than half of all non-communicable diseases (NCDs) deaths in Sub-Saharan Africa, prompting a need for structured capacity building for health workers to identify signs and symptoms, investigate, diagnose and appropriately manage CVDs at their level of service delivery and to promote prevention of CVDs with healthy lifestyles and habits.

MAIN OBJECTIVE OF THE TRAINING COURSE

The main objective of this training course is to improve the capacity of health workers at all levels of care for the prevention and management of patients with CVDs.

SPECIFIC OBJECTIVES

At completion of the training course, the participants will know:

- **The cardiovascular diseases burden in Ghana.**
- **The risk factors for CVDs and how to assess them and counsel clients accordingly.**
- **How to diagnose, treat and continuously manage patients with CVDs.**
- **How to refer patients with CVDs from lower to higher level facilities and how to receive them for further management.**

TARGET AUDIENCE

Participants of the training are supposed to be nurses from the different levels of care.

OUTLINE OF THE TRAINING MANUAL

The training manual is structured in Modules.

GENERAL MODULES

Module 1: Introduction to Cardiovascular Diseases Training Course
Module 2: Cardiovascular Disease Burden
Module 3: Risk Factors for Cardiovascular Diseases
Module 4: Symptoms and Signs of Cardiovascular Diseases

DISEASE MODULES

Module 5: Hypertension
Module 6: Stroke
Module 7: Chest Pain and Heart Attack
Module 8: Heart Failure
Module 9: Venous Thromboembolism
Module 10: Cardiac Arrhythmias
Module 11: Cardiac Arrest

STRUCTURE OF THE MODULES

Each training module is structured in the same way to facilitate flow of information and participation. The different sections are:

a. Duration of the module
b. Learning objectives
c. Material needed
d. Trainer's advance preparation
e. Methodologies used
f. Training process

TRAINING COURSE METHODOLOGY

The training methods employed in this course ensure that each participant is actively involved in the training process by contributing and participating in discussions, exercises, group work, role-plays, demonstrations and practical exercises. These different training methods are explained below along with their corresponding pictorial cues used in the facilitator's guide.

CUE METHODOLOGY

Content information, concepts, principles and analyses are delivered in a **Presentation** by the facilitator in lecture form with slides followed by a round of questions and explanatory answers, exercises or discussions.

Brainstorming is a group technique to create new ideas. The group takes a specific problem and creates as many ideas as possible in a limited time. Every group member should feel free to share any idea without receiving criticism. Members are encouraged to use other members' ideas as trigger (input) to create/associate further ideas, and to combine ideas.

Exercise sessions allow each group member to practice a principle or procedure in order to acquire the needed skill. **Case Scenarios** and **Clinical Exercises** are used to provide practice opportunities.

An **Evaluation** of the answers is done by the facilitator with the class to be sure the correct principles/procedures have been applied to answer the clinical scenario.

Role Play is a way of working through a situation, a clinical scenario or a problem by assuming roles and practicing what to say and do in a certain setting. A role-play could take place between two people simulating an issue that could arise in the workplace. This could occur with a group of people split into pairs or whereby two people role-play in front of the classroom. It can be effective in connecting theory and practice but, may not be popular with people who do not feel comfort able performing in front of a group of people.

Discussions allow every participant to present his/her view on an issue and to arrive at a consensus.

During **Group Work**, content is further analysed and illustrated by practical exercises. Group work also serves as a space to exchange experiences, discuss controversial issues and build consensus. It facilitates the active participation of all participants.

Review sessions allow for the facilitator and the participants to go over principles that have been taught in an earlier session. The facilitator takes the opportunity to clarify any issues that may not have been grasped.

Plenaries will also be used to present the results of group work and discuss these further.

MATERIAL NEEDED

The following material, tools and equipment will be needed during the training course.
These include and are not limited to the following:

- **Laptop computer and projector**
- **Flip chart with a flip chart stand**
- **Whiteboard markers**
- **Note pads, A4 sheets**
- **Sticky note paper of different colours**
- **Sheets of large size brown paper**
- **Pens, pencils and erasers**
- **Rulers, scissors, masking tape and paper glue**
- **Clinical station with clinical equipment such as sphygmomanometers (automated and manual), thermometers, stethoscopes**
- **Manual and automated external defibrillators (AED)**
- **Mannequins**
- **ECG machines**
- **ECG print outs, laboratory test results**
- **Patient monitors**
- **Case scenario handouts**
- **WHO Risk Assessment Chart**
- **Copies of *National Guidelines for the Management of Cardiovascular Diseases 2019***

COURSE FORMAT

The course targets health workers from different levels of the health system excluding staff working at Community-based Health Planning and Services (CHPS) level.
All course participants (nurses) will be assigned to groups of 5 persons and will receive training on all components of the course in this book.

EVALUATION

A pre-test and post-test will be administered to judge the improvement of knowledge of participants gained from the training.

This course will be accredited and certified for Continuous Professional Development (CPD) of nurses by the professional body in Ghana regulating the practice. Due to the importance of the training course and the expected impact on health care in Ghana, all participants will be awarded a Certificate of Participation and CPD points after the training course if they obtain a pass mark of 60% in the post test. Any course participant who scores below the pass mark of 60% will have to re-take the whole course.

At the end of each day, the participants will receive a questionnaire to explore their opinion regarding the course content and applied methodology and allow them to make suggestions. This will help to continuously improve the course. The answers and suggestions will not influence the result of the post-test.

TRAINING AGENDA

DAY 1	TOPIC	FACILITATOR
08:00 am – 08:15 am	Welcome	
08:15 am – 09:00 am	Pre-test	
09:00 am – 09:45 am	Introduction to Cardiovascular Diseases Training Course	
09:45 am – 10:45 am	Introduction to quality improvement tools	
10:45 am – 11:00 am	Coffee break	
11:00 am – 12:00 pm	Cardiovascular disease burden	
12:00 pm – 01:30 pm	Risk factors for cardiovascular diseases	
01:30 pm – 02:15 pm	Lunch break	
02:15 pm – 04:45 pm	Symptoms and signs of cardiovascular diseases	
04:45 pm – 05:00 pm	Daily evaluation, housekeeping	

DAY 2	TOPIC	FACILITATOR
08:00 am – 08:30 am	Recap of day 1	
08:30 am – 10:00 am	Hypertension	
10:00 am – 11:00 am	Stroke	
11:00 am – 11:15 pm	Coffee break	
11:15 am – 12:00 pm	Chest pain and heart attack	
12:00 pm – 01:00 pm	Heart failure	
01:00 pm – 02:45 pm	DVT / pulmonary embolism	
02:45 pm – 03:30 pm	Lunch break	
03:30 pm – 04:30 pm	Clinical practice – hypertension	
04:30 pm – 04:45 pm	Daily evaluation, housekeeping	

DAY 3	TOPIC	FACILITATOR
08:00 am – 08:30 am	Recap of day 2	
08:30 am – 09:00 am	Cardiac arrhythmias	
09:00 am – 11:00 am	Cardiac arrest (basic life support)	
11:00 am – 11:15 pm	Coffee break	
11:15 am – 12:00 pm	Post test	
12:00 pm – 01:00 pm	Mentorship / continuous data collection	
01:00 pm – 01:30 pm	Next steps from RHMT rep	
01:00 pm – 01:30 pm	Final evaluation, closing	
01:30 pm	Lunch break and departure	

DELIVERING THE TRAINING COURSE

MODULE 1: INTRODUCTION TO CARDIOVASCULAR DISEASES TRAINING COURSE

RATIONALE

To achieve the learning objectives of this training course, the participants should be able to interact and work freely with each other during the 3 days of the course. They must therefore get to know each other.

This module serves to help the participants to get known to each other as well as get to know the facilitator and to create a cordial environment within which to conduct the training.

DURATION

- **1 hour 30 minutes**

OBJECTIVES OF THE COURSE

The Objectives of this course are:

- To train health care workers for the use of the *National Guidelines for the Management of Cardiovascular Diseases* (CVDs).
- To train health care workers to acquire standardized skills to manage CVDs for their level of practice in the health care system.
- To streamline and correct lapses within the referral system for CVDs between levels of health care delivery.
- To contribute to the reduction of morbidity and mortality related to CVDs in Ghana.

MATERIALS NEEDED

- **Power point slides**
- **Name tags**
- **Marker pens**
- **Sticky note pads**

TRAINER'S ADVANCE PREPARATION

- **Prepare blank name tags for all participants and yourself**
- **Prepare all material and equipment needed for the module**

METHODOLOGIES

- **Introduction**
- **Interaction**
- **Team building**

PRESENTATION (15 MINUTES)

The facilitator should:

- Welcome the participants to the course and introduce himself/herself to the class by mentioning his/her full name, place of work, occupation, one thing s/he expects to get from participating in the training course.
- Mention the name s/he prefers to be called by during the training course.
- Write this preferred name on the name tag using the marker and pin the name tag to his/her chest.
- Ask all participants to go through the same process to introduce themselves, highlighting the following:
  - Full name and preferred name for the training course.
  - Place of work (name of health facility, category of health facility, district, region).
  - Profession and position in the health facility.
- Briefly inform participants of any administrative issues related to the course organisation.

EXERCISES (10 MINUTES)

The facilitator should make the participants conduct the following activities as part of introducing themselves:

- Each participant should write their preferred name to be used during the course on the name tag and stick it to their chest.
- Each participant should explain and write down **one (1)** thing they expect to get out of the course on a sticky note sheet and stick it up on a designated space on one of the walls in the training hall.
- Each participant should identify 4 other persons to form a group of five (5).
- Each group, once formed, should sit together around a table and identify a leader and a secretary.
- Each morning of the course, the participants should form new groups while ensuring to avoid all their group members from the previous days.

PRESENTATION (10 MINUTES)

- The facilitator should present the training course methodology to the participants, explaining the various components of the course.

A. METHODOLOGY OF TEACHING

The teaching methodology and cues used in the course are as follows:

METHODOLOGY	CUE	METHODOLOGY	CUE
Plenary		Discussion	
Brainstorming		Group Work	
Presentation		Exercise	
Role Play		Review	

B. COURSE FORMAT

The facilitator should explain the rationale behind the course format. The course is structured in modules making up a total of 11 independent modules. Each module is structured into:

- **Presentation** of information relevant to the topic
- **Exercises and activities**
- **Plenary and discussion**
- **Key messages** for the participants

During the course, the participants shall be assigned to groups of 5 persons. Membership of each group shall change every morning of the course to allow for team building and collaboration.

- **Day 1: General Modules (Module 1 to 4).** All participants shall be taught with the same focus to build the foundation of CVD management. The participants shall work together in one class. This is mandatory for all participants before continuing to the Disease Modules.
- **Day 2 to 3: Disease Modules (Module 5 to 11).** The course participants shall begin this part after they have completed the General Modules. The participants (nurses) will receive training on all components of the course.

The Training Course Programme is provided to all participants. The facilitator should go through the detailed programme outline **(Slide 9)**, for all to understand the structure of the training.

PRE-TEST (45 MINUTES)

A pre-test will be conducted at this point to objectively test participants' baseline knowledge before going through the course. The facilitator should share the questionnaires for the pre-test and allow 45 minutes for the test.

PLENARY SESSION AND DISCUSSION (10 MINUTES)

After the pre-test, the facilitator should lead a discussion on full participation in the course by all participants while collecting the filled questionnaires. The facilitator should talk about the value of the course in changing the health system for the better and reducing morbidity and mortality associated with CVDs in the country.

Due to the importance of the training course and the expected impact on health care services in Ghana, all the participants should have test scores so that they can be awarded a Certificate of Participation and CPD points after the training course. Only the participants obtaining a minimum score of 60% in the post test will be awarded a Certificate of Participation and the corresponding CPD points. Any course participant who scores below the pass mark of 60% will have to re-take the whole course.

The facilitator should provide any further administrative information needed and create a list of Do's and Don'ts for the Training Course to ensure full participation. Daily attendance should also be checked as part of compliance to the course.

COURSE NORMS

DO'S

Participants should:

- Attend every session fully.
- Arrive early each day.
- Participate fully in each exercise and group work.
- Present at least once on behalf of their group.
- Put their phones on silent mode.

DON'TS

Participants should NOT:

- Miss any session.
- Be late for each day's training.
- Refuse to participate in exercises and group work.
- Miss an opportunity to make a presentation on behalf of their group.
- Receive calls during training course.
- Use their laptops during the training course.

! The Training Course is designed to improve medical practices associated with managing patients with cardiovascular diseases in Ghana.

This Training Course is accredited for CPD points and the pass mark for receiving Certificate of Participation and CPD points is 60% including marks for participation.

MODULE 2: CARDIOVASCULAR DISEASES BURDEN

RATIONALE

The Module discusses the disease burden and impact of CVDs on the health systems of the world and of Ghana specifically. It also provides the needed information behind the development of the new *National Guidelines for the Management of Cardiovascular Diseases*. The Module closes with prescription writing and referral systems in the Ghana health system.

DURATION

- 1 hour

LEARNING OBJECTIVES

By the end of this module, participants will be able to:

- Understand the epidemiology of CVDs globally and in Ghana.
- Understand the purpose of the CVD guidelines and its structure.
- Identify resources needed for CVD management at various levels of the health system.
- Prescribe correctly.
- Conduct referrals correctly within the Ghana health system.

MATERIALS NEEDED

- Power point slides
- Flip chart
- Marker pens
- Handouts for exercises

TRAINER'S ADVANCE PREPARATION

- Review the power point slides.
- Prepare all material and equipment needed for the module.
- Ensure that other logistics (e.g. projector, laptop, etc.) are available and in working condition.

METHODOLOGIES

- Presentation
- Discussion
- Brainstorming
- Practical exercises

PRESENTATION (30 MINUTES)

The facilitator should:

- **Introduce and describe the burden of cardiovascular diseases globally and in Ghana:**
  - Define cardiovascular diseases.
  - Let participants estimate the global disease burden of cardiovascular diseases.
  - Let participants identify the 4 main types of non-communicable diseases **(Slide 15):**
    - Cardiovascular diseases (CVDs)
    - Cancers
    - Chronic respiratory diseases
    - Diabetes mellitus
- **Describe efforts to address the problem of CVDs in Ghana.**
  - Allow participants to identify what has been done so far to address this problem.
- **Discuss the importance of the CVDs Guidelines.**
  - Standardization of care
  - Level of evidence
- **Present the structure of the CVDs Guidelines (Slide 19).**
  - Review outline and content of the Guidelines
  - Levels of care
  - Resources needed for CVDs management
- **Set up a Skills Area to show the tools and equipment needed for the CVDs management (Slide 20-21).**
  - The facilitator should lead the participants to the Skills Area to review the tools and equipment.
  - The participants should form groups of 5 to identify all the tools and equipment needed for CVDs management according to the level of care.
- **Give important information for managing CVDs:**
  - Prescription writing
  - Referrals
  - Emergency systems

REFERRAL PROCESS

Why refer? (Slide 22)

- **If the health facility lacks the appropriate resources needed for the diagnosis and management of the patient in the form of:**
  - Lack of expertise/qualified health workers.
  - Lack of appropriate diagnostic tools.
  - Lack of appropriate/right medication.
- **If a patient and the family request for second opinion or different level of care.**

Patients should be referred in accordance with agreed arrangements to facilities where the necessary competence, tools and support exist.

Notification and prior information about the patient should be undertaken to ensure the receiving health facility is adequately prepared for continuity of care.

STEPS IN THE REFERRAL PROCESS (SLIDE 24)

- **Identify the facility to receive the patient.**
- **Notify the facility about the referral.**
- **Write a referral letter including:**
  - Date
  - Name and contact of referring clinician/health worker
  - Name of patient
  - Reason for referral
  - Patient's history, clinical finding, test results and prior treatment
  - Provisional diagnosis
  - Signature of referring clinician.
- **Request for feedback from the receiving clinician/facility including:**
  - Final diagnosis
  - Long term management plan and follow up
  - Name and contact of the receiving physician/health worker.

GHANA EMERGENCY NUMBERS	**Police: 191/112** **Fire Service: 192/112** **Ambulance: 193/112**

EXERCISES (20 MINUTES)

The facilitator should conduct exercises in prescription writing and referrals. The exercises must be provided to the participants as handouts.

EXERCISE 1:

Thirty-six-year-old Kwei Mensah attends your clinic and receives a prescription for his antihypertensive medicines as listed below:

- **Amlodipine 5mg taken once a day for 30 days**
- **Atorvastatin 10mg taken daily for 30 days**
- **Soluble Aspirin 75mg taken daily for 30 days**

➔ **Write a prescription for him to the pharmacy.**

EXERCISE 2:

Mr. Kwei Mensah has to be referred from Achimota Hospital to Greater Accra Regional Hospital on account of his deteriorating heart failure. He is currently on admission, having been managed for 5 days without improvement. His blood pressure is currently 180/140 mmHg.

➔ Write a referral letter and provide the right education to the client and his relations.

The facilitator should divide the participants into their groups and ask them to write the prescription and the referral letter on a flip chart paper (15 min.) After the 15 minutes, the groups must present their writings followed by a discussion.

PLENARY SESSION AND DISCUSSIONS (10 MINUTES)

The facilitator should lead a discussion on the challenges of referrals in the Ghana health system. What is done right and what is done wrong when referring clients? The facilitator should write the responses of the participants on the Do's and Don'ts of patient referrals on a flip chart. Compare this list to the list below. After this, the facilitator should present the correct referral process.

DO'S

When referring a patient to another facility, do the following:

- Call the receiving facility to inform them about the referral and discuss the patient's problem for continuity of care.
- Write a detailed referral letter providing all the needed information.
- A clinician should sign the referral letter.
- Request for feedback and provide contact information.

DON'TS

When referring a patient to another facility, DON'T do the following:

- Send the patient without calling the receiving facility to discuss the patient's condition.
- Send the patient without a detailed referral letter.
- Send a letter without a clinician's signature.
- Send a letter without asking for feedback and providing a contact number.

!

- **Primum non nocere! First, do no harm!**
- **Notification and prior discussion of the patient should be undertaken to ensure that the receiving health facility is adequately prepared for continuity of care.**

MODULE 3: RISK FACTORS FOR CARDIOVASCULAR DISEASES

DURATION

- 1 hours 30 minutes

LEARNING OBJECTIVES

By the end of this module, participants will be able to:

- Know and understand the risk factors for cardiovascular diseases.
- Undertake risk assessment.
- Counsel patients regarding modification of lifestyle and reduction of risk factors.
- Manage patients with risk factors for CVDs.

MATERIALS NEEDED

- Flip chart
- Laminated World Health Organization/International Society of Hypertension (WHO/ISH) Risk Prediction Chart
- Counselling chart
- Power point slides
- Handouts for exercises

TRAINER'S ADVANCE PREPARATION

- Thoroughly review power point presentation.
- Assemble all material and tools needed the night before.
- Ensure that other logistics (e.g. projector, laptop, etc.) are available and in working condition.

METHODOLOGIES

- Presentation
- Exercises
- Role play on counselling for lifestyle modification
- Group discussion

PRESENTATION (15 MINUTES)
IDENTIFYING RISK FACTORS OF CARDIOVASCULAR DISEASES

- The facilitator should initiate a general discussion on what risk factors are.
- Use these questions to guide discussion: What, Where, Which, Why, How?
- Identify atherosclerosis as a major risk factor for cardiovascular diseases **(Slide 29)**.
- Make a presentation to summarize discussions **(Slides 28–33)**:
  - Classification of the risk factors – explaining the difference between modifiable and non-modifiable risk factors.
  - Provide information on emerging risk factors.
  - Non-atherosclerotic cardiovascular diseases.
  - High levels of individual risk factors and the danger they pose.

PRESENTATION (15 MINUTES)
STEPS IN RISK ASSESSMENT AND HOW TO USE WHO/ISH PREDICTION CHART

- List all the risk assessment tools available **(Slide 34)**.
- Focus on WHO/ISH Prediction Charts **(Slide 35)**.
- The facilitator should carefully review steps in atherosclerotic cardiovascular diseases risk assessment **(Slide 37)**.
- The facilitator should distribute handouts of the risk assessment tools.
- Review the Risk Assessment Checklist in Table 1 **(Slide 40)**.

Table 1: **Risk Assessment Checklist for Exercises**

No.	Risc factors	Findings
1	Gender	
2	Age	
3	Diabetic Status – Yes/No	
4	Smoking Status – Yes/No	
5	BP Measurement (Indicate Level)	
6	Total Blood Cholesterol (From Lab Test)	

EXERCISES (15 MINUTES)

The facilitator should divide the class into 2 groups and lead the class to do the following exercises. The exercises are provided as a handout together with the WHO Risk Assessment Chart and Checklist, and read aloud to the participants. They should then be allowed to ask questions to well understand the exercise. Each group receives only one

exercise to complete. Answers will be written on a flip chart. The groups present their working results in the plenary.

A) A 65-year-old retired male teacher reported to Kaneshie Polyclinic OPD with complaints of numbness of both feet. He is a known diabetic for the past 5 years, compliant on metformin. He reported with a total cholesterol level of 5.5 mmol/L.

a) What other information will you like to ask him?
b) What are the risk factors for this patient?
c) How will you assess his risk of CVD using the WHO/ISH risk prediction charts?

Answers

a) Duration of symptoms, severity of symptoms, any associated symptoms such as tingling sensations in the feet, sensation of walking on foam, burning sensation in the feet.
b) Age, sex: male, diabetes and high cholesterol.
c) Step 1: Select the appropriate chart depending on the presence or absence of diabetes.
Step 2: Select male or female tables.
Step 3: Select smoker or non-smoker boxes.
Step 4: Select age group box (e.g. if age is 50–59 years select 50, if 60–69 years select 60 etc.).
Step 5: Within this box or cell, find the nearest cell where the individual's systolic blood pressure (mmHg) and total blood cholesterol level (mmol/l) cross or intercept.

B) A 60-year-old female who sells at the market has reported to the OPD for her usual blood pressure review. After congratulating her for taking her medication regularly, she tells you that she had a stroke with weakness of the left side a year ago, when she stopped her medication.

a) Will you want to assess her risk?
b) What is the risk level of this patient?

Answers

a) NO. Patient is already a risk patient as evidenced by her previous stroke.
b) This patient is high risk.

C) A 60-year old female, non-smoker, not a known diabetic, her reporting BP is 145/80 mmHg. Her fasting blood sugar was 6.7 mmol/L.

a) Would you want to assess her CVD risk and why?
b) What is her risk level if her cholesterol level is 8?
c) What preventive measures will you advise her to take?

Answers

a) Her CVD risk should be assessed as she is elderly, pre-diabetic and stage 1 hypertensive.

b) Intermediate level.

c) She should be advised to be compliant with her prescribed medications and follow-up visits. Lifestyle modification.

PRESENTATION ON THE MANAGEMENT OF RISK FACTORS

(15 MINUTES / SLIDE 42)

PLENARY SESSION AND DISCUSSIONS (15 MINUTES)

The facilitator should lead a discussion session on modifiable and non-modifiable risk factors and their importance for developing CVDs. Critically review the role of the following in CVD development **(Slides 42 to 51)**. The facilitator should carefully explain all the details and components of the following in the management of CVD risk:

- Lifestyle modification
- Behaviour changes
- Eating patterns
- Physical activities
- Sedentary time
- Stress

The facilitator should discuss how patients should be best managed in primary health care facilities.

ROLE PLAY (15 MINUTES)

The facilitator should ask the participants to volunteer and conduct a role play on counselling a patient on lifestyle modifications.

For each exercise in risk assessment provided above, selected participants should conduct a counselling session for the patient on modifying the various risk factors identified.

!

- Most cardiovascular risk factors are modifiable.
- Every health care professional should assess the cardiovascular risk of every patient and provide the appropriate intervention.
- Counselling must be based on locally appropriate interventions.
- Lifestyle modification is a key step.
- These cardiovascular risk factors lead to cardiovascular disease after several years, hence the management of CVD risk factors is for life.

MODULE 4: SYMPTOMS AND SIGNS OF CARDIOVASCULAR DISEASES

DURATION

- 2 hours 30 minutes

LEARNING OBJECTIVES

By the end of this module, participants will be able to:

- Identify common symptoms and signs associated with CVDs.
- Distinguish between symptoms and signs of CVDs.
- Differentiate and classify symptoms and signs specific for each CVD.
- Perform head to toe physical examination on a CVD patient (inspection/palpation/blood pressure measurement, etc.).

MATERIALS NEEDED

- Flipchart
- Marker pens
- Laptop and projector
- Power point slides
- Handouts
- Sphygmomanometer (automated or manual)
- Stethoscopes
- Rulers and tape measure

TRAINER'S ADVANCE PREPARATION

- Thoroughly review power point slides.
- Assemble all material and tools needed.
- Form groups of participants for discussions and practice.
- Prepare clinical practice with the facility management.

METHODOLOGIES

- Presentation
- Group exercises
- Case scenarios
- Role plays
- Clinical/practical sessions

PRESENTATION (10 MINUTES)
IDENTIFYING SYMPTOMS AND SIGNS OF CARDIOVASCULAR DISEASES

- The facilitator introduces the session with a case scenario for discussion, states the objective and guides the process of the discussion.
- Divide the class into 2 groups to identify common symptoms and signs associated with CVDs.

- Provide the following instructions:
  - Read and analyse this case scenario individually. When the others in your group have finished reading it, discuss the question and agree on possible answers. Write the answers on a flip chart. When all groups have finished, we will discuss the case scenario and your answers in the plenary.

CASE SCENARIO 1 (10 MINUTES)

Aba Yaaba, a 64-year-old market woman, who is your neighbour, comes to your house complaining of chest pain, which began about 30 minutes prior to seeing you. She describes the pain as a tightening in the chest. She reports fear of death. She is sweaty and anxious looking.

You measure her blood pressure as 85/60 mmHg; pulse is weak and is at a rate of 132 beats per minute. The pain becomes increasingly more intense and the patient is weeping.

The patient is on homeopathic treatment and does not use any other medicines.

Advise: Identify the symptoms and signs the patient presents within the story above.

Answers:

Symptoms: chest pain, fear of death, sweatiness, anxiety.

Signs: Blood pressure 85/60 mmHg, weak rapid pulse rate of 132 bpm.

DYSPNOEA (10 MINUTES)

- Define dyspnoea as in **(Slide 57)**.
- Explain the causes of dyspnoea **(Slide 58)**.

Table 2: **Common causes of dyspnoea**

Causes of dyspnoea		
Cardiovascular	**Respiratory**	**Others**
▪ Heart failure ▪ Arrhythmias ▪ Pericardial effusion ▪ Pulmonary embolism	▪ Pneumonia ▪ Bronchospasm/asthma ▪ Chronic obstructive pulmonary disease (COPD)	▪ Ascites ▪ Anaemia

CHEST PAIN (10 MINUTES)

- Define chest pain as in **(Slide 59)**.
- Present clinical classification and causes of chest pain **(Slides 61–62)**.

Table 3: **Causes of chest pain**

Causes	
Cardiac	**Non-cardiac**
▪ Myocardial infarction (heart attack) ▪ Unstable angina ▪ Stable angina (chest pain on exertion) ▪ Prinzmetal angina (variant angina) ▪ Pericarditis ▪ Aortic valve stenosis ▪ Mitral valve prolapse ▪ Pericardial effusion ▪ Congenital cardiac anomalies	▪ Pulmonary origin (pneumonia, pulmonary embolism, pleuritis, pneumothorax, asthma, COPD, acute bronchitis, lung abscess) ▪ Musculoskeletal (costochondritis, trauma, muscle pain, referred pain from spine, cancer induced pain) ▪ Mediastinal (aortic dissection, mediastinitis) ▪ Gastrointestinal (oesophagitis, gastritis, peptic ulcer disease (PUD), oesophageal spasm, cholecystitis, pancreatitis) ▪ Others (herpes zoster, post herpetic neuralgia) ▪ Psychogenic (panic attacks, psychiatric disorders, anxious state)

Use the formed groups and introduce **case scenario 2**. Ask them to discuss and write the answers to their agreed questions on a flip chart. After the group work, they should present their work in the plenary. Add, if something is missing.

CASE SCENARIO 2: CLASSIFICATION OF CHEST PAIN (10 MINUTES)

Auntie Ama, a 64-year-old woman, consults me because of her chest pain which began about 30 minutes ago. She describes the type of pain as oppressive and "as if my heart is tightened by a hand". She reports fear of death. Her face is pale and sweaty and very anxious. The physical examination reveals the following: blood pressure 100/60 mmHg, pulse imperceptible, with a heart rate of 110 per minute. The pain becomes increasingly more intense and the patient is weeping. Until today, the patient is under homeopathic treatment and does not use any other medicines.

What could be the cause of Auntie Ama's chest pain?

Answer:

Angina pectoris (definite): Meets all three of the following characteristics:

- Substernal chest discomfort of characteristic quality and duration.
- Provoked by exertion or emotional stress.
- Relieved by rest and/or nitrates within minutes.

OEDEMA (10 MINUTES)

- Define oedema as in **(Slide 63)**.
- Ask participants to write the causes of oedema on sticky papers and fix them on the wall.
- Review the causes of oedema as in **(Slide 64)**.

CASE SCENARIO 3: OEDEMA PLENARY SESSION (10 MINUTES)

Read the case scenario to the participants, ask the questions and write the answers on a flip chart. Discuss the answers and on the flip chart, leave the correct answers only.

A 67-year-old hypertensive and diabetic man had begun to notice mild swelling of the feet over the past month, which has now begun to involve the legs. He admits to drinking 5 'tots' of Akpeteshie (local gin) daily over the past 20 years. In the last 5 days, he has noticed difficulties in lying flat and also coughs at night. He has been on Nifedipine 5mg and Glibenclamide 5 mg bd for the past 7 years.

List the possible causes for the swollen legs.

Answer:

- **Causes of oedema:**
  - **Congestive cardiac failure secondary to hypertensive heart disease**
  - **Diabetic nephropathy**
  - **Decompensated alcoholic liver disease**
  - **Medication induced by nifedipine**

HAEMOPTYSIS (10 MINUTES)

- Define haemoptysis as in **(Slide 67)**.
- The facilitator should ask the class to identify causes of haemoptysis: cardiovascular, pulmonary, infectious, etc. and should write down the mentioned causes on a flip chart for further discussion.

Table 4: **Causes of haemoptysis (Slide 68)**

Causes of haemoptysis		
Cardiovascular ▪ Left ventricular failure	**Pulmonary** ▪ Pulmonary embolism/infarction ▪ Bronchiectasis	**Hematologic** ▪ Disseminate intravascular coagulopathy (DIC) ▪ Thrombocytopenia (low platelets) ▪ Bleeding disorder
Infections ▪ Pulmonary TB ▪ Lung abscess ▪ Pneumonia	**Systemic diseases** ▪ Vasculitis ▪ Goodpasture syndrome ▪ Systemic Lupus Erythematodus (SLE)	**Neoplastic** ▪ Lung cancer ▪ Metastatic cancer
Drugs/toxins ▪ Anticoagulants ▪ Aspirin ▪ Thrombolytics	**Traumatic** ▪ Chest injuries	**Iatrogenic** ▪ Bronchoscopy ▪ Transtracheal aspiration

SYNCOPE (10 MINUTES)

- Define syncope as in **(Slide 69)**.
- Present the causes of syncope **(Slide 70)**, distinguishing between cardiac and non-cardiac causes of syncope.

Table 5: **Common causes of syncope**

Non-cardiac causes	Cardiac causes
▪ Reflex/neurogenic: Vasovagal 20-33% of all cases of syncope ▪ Carotid sinus hypersensitivity ▪ Situational (e.g. micturition, defecation, cough, swallowing) ▪ Orthostatic hypotension (volume depletion, anaemia, bleeding, medicine, autonomic dysfunction) ▪ Vertebrobasilar disease (very rare severe bilateral carotid disease)	▪ Arrhythmias: tachyarrhythmias and bradyarrhythmias ▪ Acute coronary syndrome ▪ Structural: aortic stenosis, hypertrophic cardiomyopathy ▪ Pulmonary embolism ▪ Cardiac tamponade ▪ Atrial myxoma

Read aloud to the participants **case scenario 4** and discuss the answers in the plenary.

CASE SCENARIO 4: SYNCOPE (10 MINUTES)

During a military parade, a 28 year old military man suddenly falls to the ground and is rushed to your clinic. he has no known medical condition, had no complains prior to the episode.

What could be the cause for his fall?
List 3 possible causes of syncope!

Answers:

- **Syncopal attack**
- **Myocardial infarction, PE, prolonged standing**

PALPITATIONS (10 MINUTES)

- Define palpitations and its causes as in **(Slide 72)**.

Table 6: **Common causes of palpitation**

Cardiac causes	Non-cardiac causes	
▪ Atrial fibrillation/flutter ▪ Ectopic beats ▪ Heart diseases ▪ Other arrhythmias ▪ Hypertension	▪ Anaemia ▪ Alcohol ▪ Anxiety/stress ▪ Coffeine ▪ Cocaine ▪ Exercise	▪ Fever ▪ Hypoglycemia ▪ Smoking ▪ Pregnancy ▪ Hyperthyroidism

Use the formed groups and introduce **case scenario 5**. Ask the participants to discuss and write the agreed answers to their questions on a flip chart. After the group work, they should present their work in the plenary followed by further discussion.

CASE SCENARIO 5: PALPITATIONS (10 MINUTES / SLIDE 73)

A 69-year-old hypertensive patient, currently on Amlodipine 5mg and Losartan 50mg, has noticed persistent palpitations that she describes as persistent but regular. On examination, her doctor found her to have a pulse rate of 120 bpm and regular. She was also found to have a small swelling on her anterior neck.

What is the most likely reason for palpitation?
What condition may have caused it?

Answers:

- **Fast heart rate**
- **Caused by:**
  - **Thyrotoxicosis**
  - **Hypertension**

The facilitator should ask the participants to read over **case scenario 6**.
The facilitator should ask the participants to list the symptoms and signs identified in the case scenario within their groups and ask one member to present in the plenary.

ASSESSING FOR SIGNS OF CARDIOVASCULAR DISEASES

CASE SCENARIO 6: ASSESSING SIGNS OF CVDS (10 MINUTES)

Aba Yaaba, a 64-year old market woman, comes to you complaining of leg swelling and difficulty in breathing. You checked her BP at the emergency room and it was 84/50 mmHg and a pulse of 162 bpm.

What symptoms and signs did you find in the above patient?
How will you assess these signs in a patient?

Answer:

- **Symptoms: difficulty breathing(dyspnoea), leg swelling**
- **Signs: low bp, high pulse, pedal oedema**

PRESENTATION (10 MINUTES)

PERFORMING PHYSICAL EXAMINATION OF A PATIENT (SUSPECTED OF SUFFERING FROM A CVD)

- The facilitator presents a detailed procedure of examining a patient with a CVD using pictures and videos to support the presentation **(Slides 75–78)**.
- The facilitator should ask all participants to identify a partner to perform physical examination as a practice of clinical skills whilst supervising the procedure for examination.
- The participants should go through the following steps:
  - Observation/inspection
  - Palpation (touching)
  - Measurements e.g.: BMI, abdominal and hip circumference
- Move the class into a clinical ward to practice patient examination and identification of signs of cardiovascular diseases.
- After the clinical session the class should converge to go through a plenary session.

PLENARY SESSION AND DISCUSSIONS (10 MINUTES)

- The facilitator should ask the participants to share their experiences whilst on the ward.

! Identifying symptoms and signs are critical for diagnosing CVDs.

- Look out for symptoms:
  Dyspnoea, oedema, syncope, chest pain, haemoptysis, palpitations.
- Look out for signs:
  Sweating, cold clammy skin, cyanosis, anxiety & restlessness, pallor, abnormal pulse, abnormal blood pressure and body swelling.

MODULE 5: HYPERTENSION

DURATION

- 1 hours 30 minutes

LEARNING OBJECTIVES

By the end of this module, participants will be able to:

- Define and appropriately classify hypertension.
- Understand the aetiology of hypertension.
- Measure blood pressure correctly.
- Diagnose hypertension correctly.
- Understand the importance of home blood pressure monitoring.
- Detect early the complications of hypertension.

MATERIALS NEEDED

- Flip charts and marker pens
- Projector
- Laptop
- Handouts for case scenario
- Sphygmomanometer (automated and manual)
- Stethoscope

TRAINER'S ADVANCE PREPARATION

- Thoroughly review power point presentation.
- Assemble all material and tools needed the night before.
- Ensure that other logistics (e.g. projector, laptop, etc.) are available and in working condition.
- Prepare the flip chart to list the discussion points on the definition of hypertension.

METHODOLOGIES

- Presentation
- Group exercises
- Case scenarios
- Role plays
- Clinical/practical sessions

DEFINITION OF HYPERTENSION (10 MINUTES)

- Ask the participants to define hypertension.
- List their key definitions on the flip chart.
- Read aloud the definition on **(Slide 85)**.
- Check to see if this definition matches the participants' views of hypertension.
- Acknowledge appropriate additions to the definition.
- Summarise the key points in the definition for the participants.

EPIDEMIOLOGY, AETIOLOGY & CLASSIFICATION (15 MINUTES)

- Present **(Slide 86)** on the epidemiology of hypertension to emphasise the importance of the disease.
- Ask the participants how hypertension can be classified.
- Take the participants through the classification and aetiology of hypertension **(Slides 88-89)**.
- The facilitator should ask the participants about the 5 most common causes of hypertension and list them on the flip chart. Compare responses to the list on **(Slide 90)**.
- Present the predisposing factors for essential hypertension **(Slide 91)**.

CLINICAL PRESENTATION (10 MINUTES)

- Ask the participants to describe the clinical presentation of hypertension. How will you identify a patient with hypertension? Write suggestions on a flip chart.
- Take the participants through the power point slides on the clinical presentation of hypertension **(Slides 99-100)**.

DIAGNOSIS OF HYPERTENSION (15 MINUTES)

- Show power point presentation on diagnosis of hypertension **(Slides 93 to 94)**.
- Demonstration and practice on how to take BP measurements in the facility using video presentation **(Slides 95-99)**.
- Divide the participants into their pre-assigned groups for group work.

- Distribute handout of clinical **case scenario 7**.
- Ask the participants to read the case scenario and answer the questions.
- The participants will present their group responses in a plenary session after 10 minutes.
- Ask for any reactions to the presentations after all groups have presented.
- Give feedback to the teams emphasizing the key criteria for the diagnosis of hypertension.

CASE SCENARIO 7 / GROUP WORK: HYPERTENSION

Akua Mansa is 38 years old. She is attending the clinic for a routine appointment about her contraception, for which she uses a diaphragm.

Medical history

From her records, you notice that, Akua's blood pressure has increased since her last check-up, twelve months ago. Akua, however, insists that whenever she takes her blood pressure at home it's never above 130/80 mmHg. She does not smoke but drinks 10-12 units of alcohol per week and has no notable medical history.

Examination

Akua's first clinic blood pressure measurement is 158/94 mmHg. Her heart rate is 72 beats per minute and regular.

Is Akua hypertensive? What would you do next?

Answer:

Akua should be advised on home BP monitoring.

What would you do next?

Answer:

Akua should be counselled on lifestyle changes such as healthy diet including cutting down on salt intake, regular exercise and cutting down on alcohol intake. In addition, ask Akua to monitor her BP at home and to show the readings at the next review.

Relevant recommendations for the facilitator to highlight:

- Because automated devices may not measure blood pressure accurately if the pulse is irregular (for example, in atrial fibrillation), palpate the radial or brachial pulse before measuring blood pressure. If pulse is irregular, measure blood pressure manually using direct auscultatory method.
- If blood pressure measured in the clinic is ≥ 140/90 mmHg, take a second measurement during the consultation. If the second measurement is substantially different from the first, take a third measurement. Record the average of the last two measurements as the clinic blood pressure.

MANAGEMENT (15 MINUTES)

- Review the diagnostic and treatment option identified on **(Slides 106)** for Level 1 facilities.
- The facilitator should highlight the need for the health worker at Level 1 to rapidly identify warning signs for referral and to appropriately refer to the next facility with a doctor **(Slide 107)**.

COMPLICATIONS (10 MINUTES)

- Let the participants brainstorm on the various complications that can arise from hypertension. Write suggestions on a flip chart.
- Take the participants through the presentation on the complications of hypertension **(Slides 108 to 109)**.

PREVENTION (15 MINUTES)

- Let the participants brainstorm on the various ways of preventing hypertension and delaying the onset of complications in hypertensive patients.
- Write the responses on the flip chart.
- Take the participants through the presentation, highlighting areas missed out during the brainstorming session **(Slide 110)**.
- Lead the discussion as the participants answer the **question 3** of **case scenario 7**. (Refer the participants to non-pharmacological management of hypertension for lifestyle modifications that can help).

CASE SCENARIO 7 / GROUP WORK: HYPERTENSION

You identify her dietary sodium intake is greater than recommended levels. Additionally, Akua Mansa's exercise patterns are not in line with the recommended guidelines. What advice would you offer?

Answer:

You should advise that healthy diet and regular exercise can reduce blood pressure. You should also encourage her to keep her dietary sodium intake low as this can reduce blood pressure.

Relevant recommendations for the facilitator to highlight:

- Ascertain people's diet and exercise patterns because a healthy diet and regular exercise can reduce blood pressure.
- Offer appropriate guidance and written or audiovisual materials to promote lifestyle changes.
- Encourage people to keep their dietary sodium intake low, either by reducing or substituting sodium salt, as this can reduce blood pressure.

!

- **Hypertension is a chronic medical condition and the leading cause of CVD deaths Africa.**
- **Hypertension is largely asymptomatic and undiscovered. Every encounter with adult patients is an opportunity for screening.**
- **A diagnosis of hypertension should be confirmed by:**
  - **Repeated clinic blood pressure (BP) measurements over a number of visits Or**
  - **Out of clinic BP measurements using home BP monitoring or ambulatory BP monitoring.**
- **Hypertension is not curable, but it requires lifelong pharmacological and non-pharmacological treatment.**
- **Adequate treatment prevents CVD and CVD related deaths.**
- **Strict compliance with medication and regular follow ups is necessary to prevent these complications.**

MODULE 6: STROKE

DURATION

- 1 hour

LEARNING OBJECTIVES

By the end of this module, participants will be able to:

- Define and appropriately classify stroke.
- Understand the aetiology of stroke.
- Detect early complications of stroke and appropriately manage them.

MATERIALS NEEDED

- Flip chart and marker pens
- Laptop computer and projector
- Samples of imaging films (echo, CT scans, chest X-ray)
- Samples of ECG strips
- Diagram of the anatomy of the brain and cerebral vessels
- Presentation slides
- Handouts with case scenarios and questions

TRAINER'S ADVANCE PREPARATION

- Review power point presentation slides.
- Prepare the flip chart for activities to determine the aetiology and classification of strokes.
- Assemble all teaching materials before start of course.

METHODOLOGIES

- Presentation
- Group exercises
- Case scenarios
- Role plays
- Training videos for neurological assessment
- Clinical/practical sessions

DEFINITION OF STROKE (10 MINUTES)

- The facilitator should ask the participants to define stroke.
- List their key definitions on the flip chart.
- The facilitator should select a participant to read aloud the definition of stroke on **(Slide 118)**.
- Check to see if this definition matches the participants' views of stroke.
- The facilitator should acknowledge the appropriate additions to the definition.
- Summarise the **Key Points** in the definition for emphasis.

AETIOLOGY AND CLASSIFICATION OF STROKE (15 MINUTES)

- The facilitator should ask the participants how stroke can be classified.
- Take the participants through the presentation on the classification of strokes **(Slides 119–124)**.
- **Picture Quiz:** Differentiate between the two types of strokes presented in the CT scans of the head on **(Slide 123)**:
  - A: Infarctive stroke
  - B: Hemorrhagic stroke
- Emphasise criteria for the classification of strokes and mention Transient Ischaemic Attack (TIA) because it is a precursor to a stroke **(Slide 125)**.
- Discuss the risk factors of stroke in **(Slide 127)**.

CLINICAL PRESENTATION OF STROKES (15 MINUTES)

- Ask the participants to describe the clinical presentation of strokes.
- How will you identify a patient with a stroke? Ask them to answer as you write these on a flip chart.
- Take the participants through **(Slides 128 to 130)** on the clinical presentation of stroke.

- The facilitator should divide the class into 2 groups to work on the **case scenario 8**.
- Ask the participants to read out the instructions and the questions.
- The participants will present their group responses in a plenary session after 10 minutes.
- Ask for any reactions to the presentations after all groups have presented.
- Give feedback to the teams, emphasising the key criteria for the clinical presentation and diagnosis of stroke.

CASE SCENARIO 8 / GROUP WORK: STROKE

A 65-year-old man with a history of hypertension was brought to the emergency room with a history of weakness on the right half of the body, with a facial deviation to the left of 1-day duration.

What symptoms or signs does the patient have that suggest a diagnosis of stroke?

Answer:

Unilateral weakness on the right half of the body, facial deviation.

What other important assessment will you do for this patient?

Answer:

Swallowing test, blood pressure, temperature, random blood sugar.

Demonstrate: how you would examine this patient?

Answer:

Demonstrate and show video of how to examine patient.

How would you manage this patient?

(The facilitator should review the management option identified on **(Slides 133–136)** for Level 1 facilities. The patient's survival and reduction of further morbidity is critical in the management of strokes.)

Answer:

- **Assess ABC (airway, breathing and circulation).**
- **Perform swallowing test.**
- **Carefully move patient whenever needed to avoid injuries especially in affected side of body.**
- **Elevate the head of the patient at 20–30 degrees.**
- **Check vital signs (BP, pulse rate, respiratory rate, temperature, random blood sugar).**
- **Manage any fever with Paracetamol suppositories.**

➔ **Refer the patient as soon as possible to a facility with a doctor for further management.**

What complications are likely to occur?

Answers:

Early Complications:

- Infection
  - aspiration pneumonia/lobar pneumonia
  - urinary tract infection (UTI)
- Dysphagia

- DVT and PE
- Bedsores
- Seizures
- Shoulder pain (weak arm, hanging and pulling on the shoulder)

Late Complications:
- Seizures/epilepsy
- Depression
- Sleep-disordered breathing
- Falls and injuries
- Limb contractures (permanent deformities)

COMPLICATIONS (10 MINUTES)

- Let the participants brainstorm on the various complications that can arise from stroke.
- Guide the participants through the presentation on the complications of stroke **(Slides 137-139)**.

PLENARY SESSION AND DISCUSSIONS (10 MINUTES)

- The facilitator will guide a discussion session to consolidate learning and end with Key Messages.

!

- **Prevention of strokes is more important than treatment.**
- **Number 1 risk factor for strokes is hypertension.**
- **All stroke cases should be referred to a facility with a doctor.**
- **Stroke management is a multidisciplinary approach requiring good nursing care to avoid complications.**

MODULE 7: CHEST PAIN AND HEART ATTACK

DURATION

- 45 minutes

LEARNING OBJECTIVES

By the end of this module, participants will be able to:

- Understand the concept of angina pectoris and myocardial infarction.
- Understand the clinical presentation of angina.
- Understand the essence of time in acute myocardial infarction.

MATERIALS NEEDED

- Flip chart and marker pens
- Diagram of the anatomy of the heart and coronary arteries
- Presentation slides
- Handouts with case scenarios and exercises

TRAINER'S ADVANCE PREPARATION

- Review the power point presentation slides.
- Prepare the flip chart for activities.
- Assemble all teaching materials and tools the night before.
- Review exercises and check if material for role plays is assembled.
- Prepare the clinical practise with the facility management.

METHODOLOGIES

- Presentation
- Group exercises
- Case scenarios
- Role plays
- Clinical/practical sessions

DEFINITION OF MYOCARDIAL INFARCTION (15 MINUTES)

- Ask the participants to define myocardial infarction.
- List the key definitions on the flip chart in 3 columns.
- The facilitator should review definition on **(Slide 143)**.

MANAGEMENT OF CORONARY ARTERY DISEASE (15 MINUTES)

STABLE CORONARY ARTERY DISEASE

Management of stable coronary artery disease aims at the following objectives **(Slide 151):**

- Relieve chest pain and any other symptoms.
- Improve quality of life.
- Prevent complications of CAD such as acute myocardial infarction or heart failure.
- Identify and manage modifiable risk factors.
- Prevent cardiovascular related death.

MANAGEMENT FOR NURSES

The facilitator should discuss management at Level 1 facilities focusing on non-pharmacological management **(Slide 152)**.

- **Basis investigations:** Full blood count, sickling test and random/fasting blood sugar.
- Assess the patient's blood pressure and oxygen saturation level.
- **Healthy lifestyle modifications:** weight control, lipid management, compliance with BP control, smoking cessation and avoidance of second-hand smoke.
- **Patient education:** to improve lifestyle where necessary.
- **Pharmacological management:** Designed to reduce frequency of angina episodes, myocardial infarctions and coronary deaths.

The participants should form 2 groups and discuss the exercise questions. They are to be given **15 minutes** for the exercise. The answers of the questions are presented and discussed in the plenary.

EXERCISES

EXERCISE 1: A 60-year-old hypertensive patient was seen at the emergency complaining of worsening exertional chest pain. The pain is relieved by rest and by the GTN spray. Two years ago, the pain was mild on moderate exertion but currently, he could not go for his normal jogging because of the pain.

1. What type of pain is this?

Answers:

1. Angina pectoris

EXERCISE 2: A 60-year-old man was seen at the O.P.D with the complaints of chest pain whiles jogging. The patient claims that he normally gets this chest pain during exercise, but it is relieved by rest. Unfortunately, this chest pain did not go with rest and it has been still present for the past 30 minutes and he has had an episode of vomiting. His ECG done was normal.

1. What is your diagnosis?
2. How will you manage this patient?

Answers:

1. Myocardial infarction
2. Management plan:
   - Admit
   - Give oxygen if oxygen saturation is < 95%.
   - Monitor the vitals and inform the doctor immediately.

- The importance of medication adherence for managing symptoms and retarding disease progression.
- How to recognize worsening cardiovascular symptoms and the need to rush to a medical facility once such symptoms occur.
- Adherence to a diet that is low in saturated fat, cholesterol, and trans-fat; high in fresh fruits, whole grains, and vegetables.
- Importance of healthy lifestyle modification.

MODULE 8: HEART FAILURE

DURATION

- 1 hour

LEARNING OBJECTIVES

By the end of this module, the participants will be able to:

- Define heart failure.
- Identify the causes of heart failure.
- Identify predisposing factors for heart failure.

MATERIALS NEEDED

- Flip charts and marker pens
- Projector
- Laptop
- Handout with case scenarios
- Laminated New York Classification of heart failure
- Pulse oximeter
- Weighing scale
- Stethoscope
- Sphygmomanometer (automated and manual)

TRAINER'S ADVANCE PREPARATION

- Review the power point presentation slides.
- Prepare the flip chart for activities.
- Assemble all teaching materials and tools the night before.
- Review exercises.

METHODOLOGIES

- Presentation
- Group exercises
- Case scenarios
- Role plays
- Clinical/practical sessions

DEFINITION OF HEART FAILURE (10 MINUTES)

- Ask the participants to define heart failure (HF).
- List their key definitions on the flip chart.
- Define heart failure as shown on **(Slide 158)**.
- Check to see if this definition matches the participants' views of heart failure.
- Emphasize key aspects of the definition.
- Summarise the key points in the definition for the participants.

Key Points to note in the definition (Slide 158):

- **HF is a clinical syndrome, not a disease. Always look for the underlying disease causing it.**
- **It is characterised by inadequate cardiac output to meet tissue metabolism.**

The facilitator should present the **Quick Quiz Questions** and have the participants answer them.

AETIOLOGY AND CLASSIFICATION OF HEART FAILURE (10 MINUTES)

- Ask the participants about the causes and classification of heart failure.
- Take the participants through the power point presentation on the management of heart failure **(Slides 161-162)**.

NEW YORK HEART ASSOCIATION (NYHA) FUNCTIONAL CLASSIFICATION

- **Class I: No symptoms and no limitation of ordinary physical activity.**
- **Class II: No symptoms at rest but slight limitation of ordinary activity.**
- **Class III: No symptoms at rest but marked limitation of ordinary physical activity.**
- **Class IV: Symptoms at rest and during any physical activity.**

PRESENTATION (10 MINUTES)

- Ask the participants to describe the clinical presentation of heart failure. How will you identify a patient with heart failure? Ask them to answer as you write these on a flip chart.
- Guide the participants through the power point session on the clinical presentation of heart failure **(Slide 163)**.
- Emphasize the typical and atypical symptoms of heart failure.
- Have the participants discuss and answer the Knowledge Check Questions on the NYHA classification. This should happen in groups, answers written down on a flip chart and presented in the plenary.

KNOWLEDGE CHECK 1: CLASSIFICATION OF HEART FAILURE

Mr. Attuam is a farmer who has been walking for 2 km to the farm for the past three years. He noticed two months ago that he is unable to walk to the farm without stopping to rest several times due to breathlessness. At rest, he is not breathless, but the breathlessness occurs when he tries to do minimal physical activity such as bathing and eating.

What NYHA STAGE is he at?

➔ Answer: NHYA Stage 3

KNOWLEDGE CHECK 2: CLASSIFICATION OF HEART FAILURE

Mrs. Kusi has been experiencing spells of breathlessness. She is currently breathless at the least exertion. She is even breathless at rest.

What NYHA STAGE is she at?

➔ Answer: NHYA Stage 4

MANAGEMENT (10 MINUTES)

- Ask the participants to write down on sticky notes how they would manage patients with heart failure.
- Collect their responses and redistribute it around the class.
- Ask them to read out the responses they have written in turns.
- Take the participants through the power point presentation on the management of heart failure **(Slides 166-167)**. Highlight key aspects that were not discussed in the brainstorming session.

ACUTE HEART FAILURE: MANAGEMENT BY NURSES

Basic laboratory investigations and imaging

- Full blood cell count
- Fasting blood sugar

Non-pharmacologic treatment

- Admit the patient and prop up in bed.
- Give oxygen in case of hypoxia (SpO2 <92%).
- Do not give iv fluids!

Precipitants for acute decompensation/worsening of heart failure in a stable patient

- Non-compliance to treatment (failure to take medication and diet / fluid restrictions).
- Medications (e.g. NSAIDS)
- Infection (respiratory and urinary tract infections, malaria, etc.).
- Arrhythmias (e.g. atrial fibrillation)
- Myocardial infarction
- Renal failure

EXERCISES (10 MINUTES)

Group Work: Case Study

- Let the participants form 2 groups.
- Each group will be assigned with a clinical case study on heart failure to be managed.
- Each group will outline their management on A2 sheets to be presented by a group representative during the plenary session.
- Allow the participants and other facilitators to give feedback to the various team presentations.

CASE SCENARIO 9: HEART FAILURE

64-year-old Mr Ato Forson is a known hypertensive patient with dyslipidaemia on Amlodipine 10mg, Bendrofluazide 2.5mg and Atorvastatin 10mg. He presents with a 3-days history of severe palpitation and a day's history of dyspnoea and cough with bloody sputum.

What are the symptoms of heart failure?

Answer:

- **Symptoms: cough, dyspnoea, haemoptysis (bloody cough).**

On examination, he is found to be dyspnoeic at rest, tachycardia of 124 bpm. He had a blood pressure of 90/60 mmHg, a respiratory rate of 38 cpm with pedal oedema up to the mid shin of both legs.

What are the signs that suggest heart failure?

Answer:

Signs: dyspnoeic at rest, tachycardia, low BP, pedal oedema.

PLENARY SESSION AND DISCUSSIONS (10 MINUTES)

The facilitator will guide a discussion session to consolidate learning and end with Key Messages.

In summary:

Patient management

- The patients should be propped up.
- **SPO2 should be monitored with a pulse oximeter.**
- **Urine output should also be monitored.**
- **Fluid intake should be restricted.**
- Check patient's weight.
- Reassess New York Heart Association Functional Classification.
- Check blood pressure.
- Check pulse rate.
- Assess for compliance to treatment.

- **Prevent heart failure by proper management of hypertension.**
- **Look for predisposing factors for heart failure in someone who has been stable on heart failure medications.**
- **Patient education on lifestyle modification, fluid and salt restriction and adherence to treatment is very important as well as daily weighing.**
- **Family members should be involved in the heart failure management at home.**

MODULE 9: DVT AND PE

DURATION

- 1 hour 45 minutes

LEARNING OBJECTIVES

By the end of this module, the participants will be able to:

- Define DVT and PE.
- Identify the risk factors associated with DVT and PE.
- Describe the signs and symptoms associated with DVT and PE.
- Understand the complications of DVT and PE.

MATERIALS NEEDED

- Flip chart and marker pens
- Projector
- Laptop
- Handout with case studies
- Sticky notes

TRAINER'S ADVANCE PREPARATION

- Review the power point presentation slides.
- Prepare the flip chart for activities.
- Assemble all teaching materials and tools the night before.
- Review exercises.

METHODOLOGIES

- Brain storming
- Plenary discussion
- Case scenarios

DEFINITION OF DVT AND PE (10 MINUTES)

- The facilitator should ask the participants to brainstorm on DVT and PE.
- The facilitator should summarise the collective thoughts and use the power point presentation as a guide to take the participants through the definition of DVT and PE **(Slides 173-175)**.

RISK FACTORS OF DEEP VEIN THROMBOSIS (DVT) (10 MINUTES)

- Ask the participants to write down the possible risk factors of DVT on sticky notes. The facilitator should then collect the answers and paste them on a central board.
- Ask the participants to discuss the risk factors and causative factors they noted down and how they increase an individual's risk for deep vein thrombosis **(Slide 176)**.

CLINICAL PRESENTATION (10 MINUTES)

- Ask the participants to describe the common signs and symptoms of deep vein thrombosis. The facilitator should take the participants through the power point presentation on the signs and symptoms of deep vein thrombosis **(Slide 177)**.

KNOWLEDGE CHECK: DVT (15 MINUTES)

Ask the participants to answer the following knowledge check individually on sticky notes.

A 55-year-old man, Kwadwo Adongo, who was recently diagnosed of a prostate cancer, presents with a two-day history of a left leg swelling. On examination, the left leg was found to be swollen, tender (painful) with pitting oedema. The left leg was 4 cm larger than the right leg.

What are the signs of DVT in this patient?

➔ **Answer:**

Swollen (4cm larger than the right leg), tender and pitting oedema of the left leg.

MANAGEMENT (SLIDE 180 / 10 MINUTES)

Lead the participants through **(Slide 180)** for management.

MANAGEMENT BY NURSES

- Provide pain relief with analgesic.
- Elevate the affected leg.

- Ensure bed rest.
- Don't massage the calf.

➔ Refer to a facility with a doctor.

KNOWLEDGE CHECK: PE

Mr. Adongo was sent to the radiology department for compression ultrasound. On his way to the ward, he complained of sudden onset of chest pain and dyspnoea.

1. What is the most likely explanation for this dyspnoea?
2. How would you manage this case?

➔ **Answers:**

1. Acute pulmonary embolism

The facilitator should harvest various responses from the participants and write them out on a flip chart to be referred to after the session on management.

2. Admit the patient:

- **Prop him up in bed.**
- **Administer supplemental O_2, if SpO_2 < 94%**
- **Check vitals: RR, BP, PR and continue close monitoring thereafter.**

➔ Call the doctor immediately.

PULMONARY EMBOLISM (PE) (10 MINUTES)

- The facilitator should ask the participants to recall from the beginning session what the definition of pulmonary embolism is.
- The facilitator should take the participants through the presentation on the clinical signs and symptoms of pulmonary embolism.

CLINICAL PRESENTATION OF PE (10 MINUTES)

- Ask the participants about the signs and symptoms of PE

MANAGEMENT OF PULMONARY EMBOLISM (10 MINUTES)

- Ask the participants to brainstorm on the possible management of pulmonary embolism.
- Take the participants through the presentation on the management of pulmonary embolism **(Slide 185)**.

MANAGEMENT BY NURSES

➔ **Immediate referral to a facility with a doctor.**

- Whilst waiting for transport:
  - Intranasal oxygen
  - Elevate head of bed

PREVENTION (10 MINUTES)

For nursing care, the emphasis for prevention of DVT and PE are:

- Early mobilisation
- Use of compression stockings

PLENARY SESSION AND DISCUSSIONS (10 MINUTES)

The facilitator guides a discussion session to consolidate learning and ends with Key Messages.

!

- **Early mobilization of the patient after medical or surgical procedure or admission.**
- **The risk of DVT and PE in chronically immobilized patients is the same in hospital as well as out of hospital (home).**

MODULE 10: CARDIAC ARRHYTHMIAS

DURATION

- 30 minutes

LEARNING OBJECTIVES

By the end of this module, participants will be able to:

- Understand common symptoms and signs of arrhythmias.
- Identify the common causes of arrhythmias.
- Identify brady- and tachyarrhythmias using the radial pulse.

MATERIALS NEEDED

- Power point presentation
- Laptop
- Flipchart and marker pens
- Mannequins
- Automated External Defibrillator (AED)
- Hand out of exercises and answer sheets

TRAINER'S ADVANCE PREPARATION

- Thoroughly review the power point presentation to understand course material.
- Assemble all materials and tools the night before.
- Put AED on charge all night.
- Practice how to use AED machine.

METHODOLOGIES

- Presentation/lecture
- Case studies
- Exercises
- Group discussion
- Brainstorming

PRESENTATION (15 MINUTES)

DEFINITION OF ARRHYTHMIA

- Ask the participants to define arrhythmias and write the definition on a flip chart.
- Present the definition on **(Slide 189)**.
- The facilitator should go through classification of arrhythmias **(Slides 189–192)**.
- The facilitator should ask and write on the flip chart the causes of arrhythmias **(Slide 193)**.

CLINICAL PRESENTATION AND DIAGNOSIS

- Ask the participants to differentiate among the symptoms and signs of arrhythmias.
- The facilitator should present **(Slide 358)**.

MANAGEMENT

- ECG if available.

➔ **Refer to a facility with a doctor if symptomatic arrhythmia is suspected. Do not delay referral if ECG is not readily available.**

PLENARY SESSION AND DISCUSSIONS (15 MINUTES)

- The facilitator guides a discussion session to consolidate learning and ends with Key Messages.
- The facilitator should show the video on the use of an automated external defibrillator (AED). The participants should practice how to use AED and do CPR.

!

- **Arrhythmias are common and are a common presentation of systemic as well as cardiovascular diseases.**
- **Identification of the arrhythmia is an important step in the management.**
- **Unstable arrhythmias are life-threatening and need urgent intervention including CPR.**

MODULE 11: CARDIAC ARREST

DURATION

- 2 hours

LEARNING OBJECTIVES

By the end of this module, participants will be able to:

- Identify cardiac arrest.
- Understand common symptoms of cardiac arrest.
- Understand the common causes of cardiac arrest.
- Manage cardiac arrest.
- Prevent cardiac arrest.

MATERIALS NEEDED

- Power point presentation
- Flip chart
- BLS algorithm charts
- Demonstration mannequins
- Automated External Defibrillator (AED)
- Case studies and exercises

TRAINER'S ADVANCE PREPARATION

- Thoroughly review the power point presentation to understand course material.
- Assemble all materials and tools the night before.
- Put defibrillator on charge all night.
- Practice how to use AED machine.
- Review exercises and practical sessions.

METHODOLOGIES

- Presentations
- Case studies
- Exercises
- Practical sessions

PRESENTATION (30 MINUTES)

DEFINITION OF CARDIAC ARREST AND SUDDEN CARDIAC DEATH

- Ask the participants to define cardiac arrest and sudden cardiac death.
- List their key definitions on a flip chart.
- Define cardiac arrest as shown on **(Slide 198)**.
- Compare the definition on the slide to the answers given by the participants.
- Emphasize on key aspects of the definition.

Key points in the definition

- **Cardiac arrest is an abrupt cessation of the heart due to an electrical disturbance of the heart, which results in failure of the heart to effectively pump blood to the brain and other parts of the body.**
- **Cardiac arrest is not the same as a heart attack, heart failure and cardiogenic shock.**
- **Hypertension is the main cause of cardiac arrest.**

AETIOLOGY AND CLASSIFICATION

- Ask the participants of the various causes of cardiac arrest.
- With illustrations from the slide, discuss the **shockable** and **non-shockable** rhythms of cardiac arrest.
- Take the participants through the reversible causes of cardiac arrest (5Hs and 5Ts), **(Slide 201)**.

The most common reversible causes of cardiac arrest are summarized below (5Ts and 5Hs):

5Hs

- Hypovolaemia
- Hypoxia
- Hydrogen ions (acidosis)
- Hypo-/hyperkalaemia
- Hypo-/hyperglycaemia

5Ts

- Tension pneumothorax
- Tamponade (cardiac)
- Toxins (including drugs)
- Thrombosis (pulmonary embolism)
- Thrombosis (ACS or MI)

CLINICAL PRESENTATION

- Ask the participants how a patient with cardiac arrest would present. Write these answers on the flip chart.
- Take the participants through the clinical presentation of cardiac arrest and causes as discussed in **(Slides 202–203)**.

> **!** **Persons in cardiac arrest may be unconscious and may not have a palpable femoral and carotid pulse.**

MANAGEMENT

- The facilitator should emphasize on the urgency of initiating Cardiopulmonary Resuscitation (CPR) in patients with cardiac arrest.
- Ask the participants if any of them has been trained on the BLS (*Figure 1*).
- Ask the participants to share their experiences on the use of CPR to resuscitate patients and demonstrate how they went about it on the mannequins.
- Go through CPR **(Slides 205–207)**.

MANAGEMENT BY NURSES

Initiate CPR according to BLS protocols and ensure the patient has a **palpable pulse** before **referral to the nearest hospital with a doctor**.

LABORATORY INVESTIGATIONS

- Random blood sugar
- Full blood count
- ECG

PHARMACOLOGIC TREATMENT

- Give oxygen if SPO_2 is less than 92%
- Start BLS CPR protocol

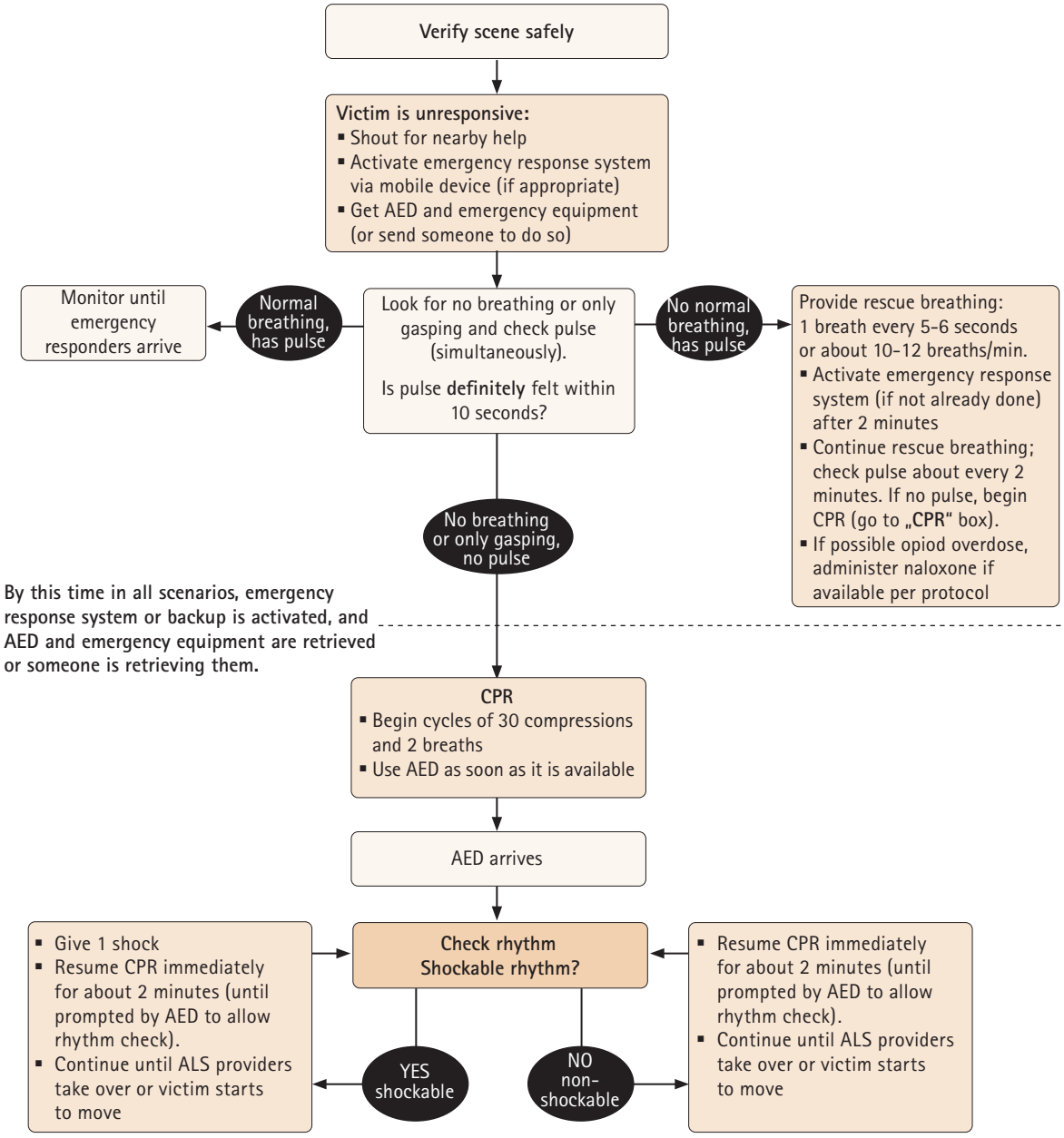

Figure 1: Basic Life Support (BLS) Algorithm

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