

MODULE

# ***Pneumonia in Under-Five Children***

For the Ethiopian Health Center Team



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## **Preface**

Teaching -learning is a challenge under all circumstances. It is even more challenging in developing countries like Ethiopia where textbooks are scarce, learning materials few, teachers overwhelmed and conditions unfavorable. Moreover, many of the learning materials such as textbooks are often bulky and at times not suitable to the conditions existing in the home country.

These modules are prepared specifically for the health center team, which must learn to work effectively together. The health center team is basically involved in primary care at the grass-root level. Most of the activities concentrate on health promotion, identification and treatment of common illnesses, and disease prevention and control.

This module addresses childhood pneumonia, which is a major killer disease in children under five years of age. The Core Module is prepared for health officers, public health nurses, environmental health and medical laboratory technology students. The health officer training is B.Sc. level training. There are two programs: 1) the post-basic where the training is given for nurses a duration of two and half years, and 2) the generic where new entrants from high school are accepted and trained for four years. The other categories of students are trained at the diploma level (two-year).

We believe that the essentials of pneumonia should be known by all categories. Satellite modules are prepared to strengthen the professional training of each student category. They supplement what is included in the Core module.

It should be pointed out that this module is not supposed to replace textbooks. This module does show clearly that it is essential to consider the teacher, the students, the learning materials and the circumstances together. It is hoped that the reading of this module will stimulate teachers to produce teaching materials that are problem-based and learner centered.

## **Acknowledgement**

The development of the modules has gone through series of meetings, discussions, revisions, writings, individual and group works. We would like to express our deep appreciation to the Carter Center, Atlanta, Georgia for funding the activities all the way through. The contribution of Prof. Dennis G. Carlson, Senior Consultant at the Carter Center is immense. Without his help the modules would not have been materialized. Many people at home and abroad have contributed their ideas and materials to the development of the modules. Dr. Tesfaye Tessema, Dean of Gondar College of Medical Sciences has contributed a lot in facilitating the development of the modules. Other individuals who are acknowledged for revising the modules are Dr. Sirak Hailu, Dr. Sissay Anberbir, Dr. Girmay Hailu, Dr. Tesfaye Getaneh, Dr. Charles Larson, Prof. Donald Johnson, Prof. Nicholas Cunningham, Prof. Joyce Murray, and Dr. Asfaw Desta, We thank the departments of Nursing, Environmental Health and Laboratory Technology of the Gondar College of Medical Sciences. The teams of Jimma University, Addis Ababa University, Alemaya University, and Southern University are acknowledged. Finally, the contributions of health officer, environmental health, nursing, and laboratory technology students during pre-testing of the materials are appreciated.



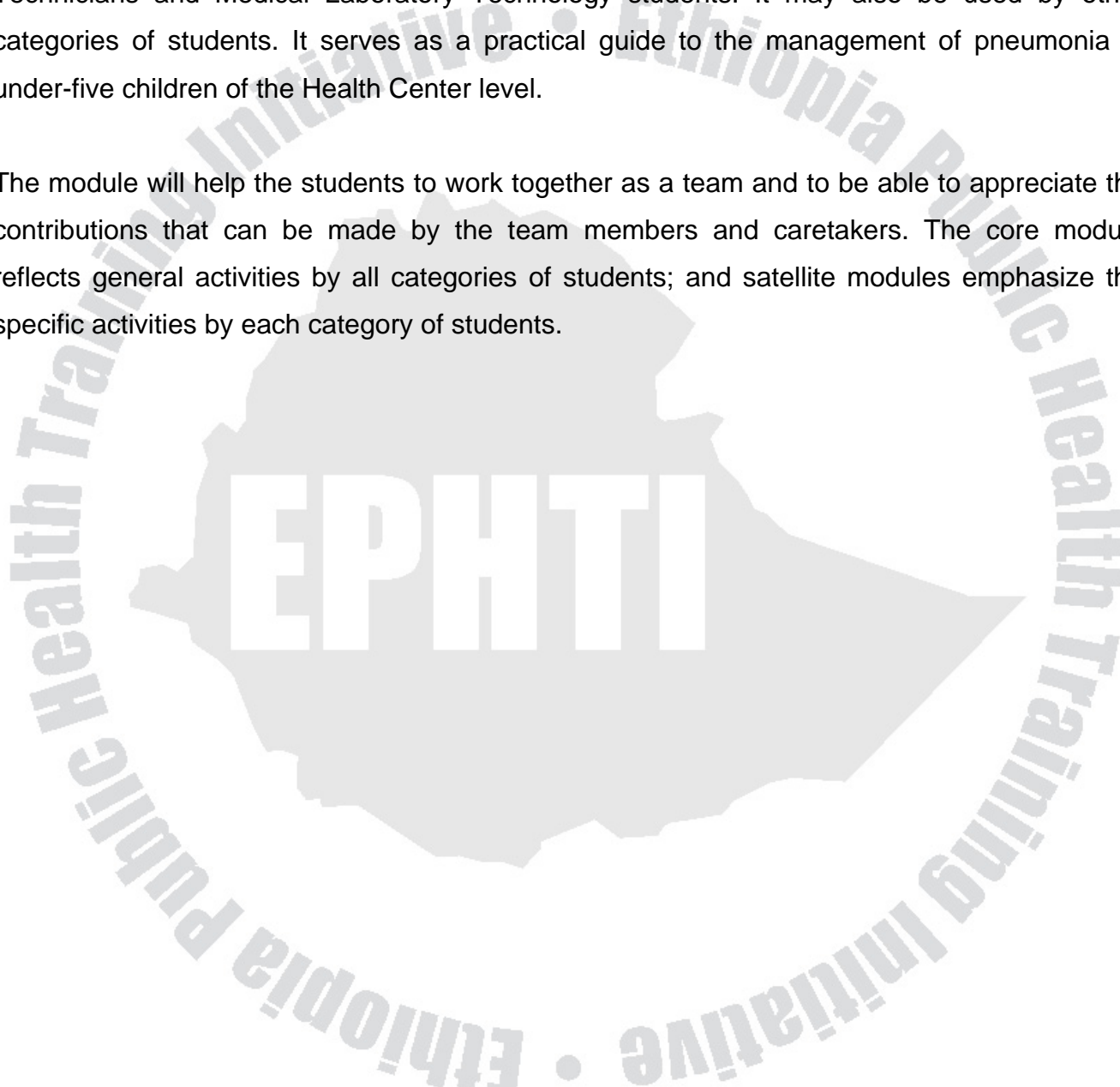
# UNIT ONE

## INTRODUCTION

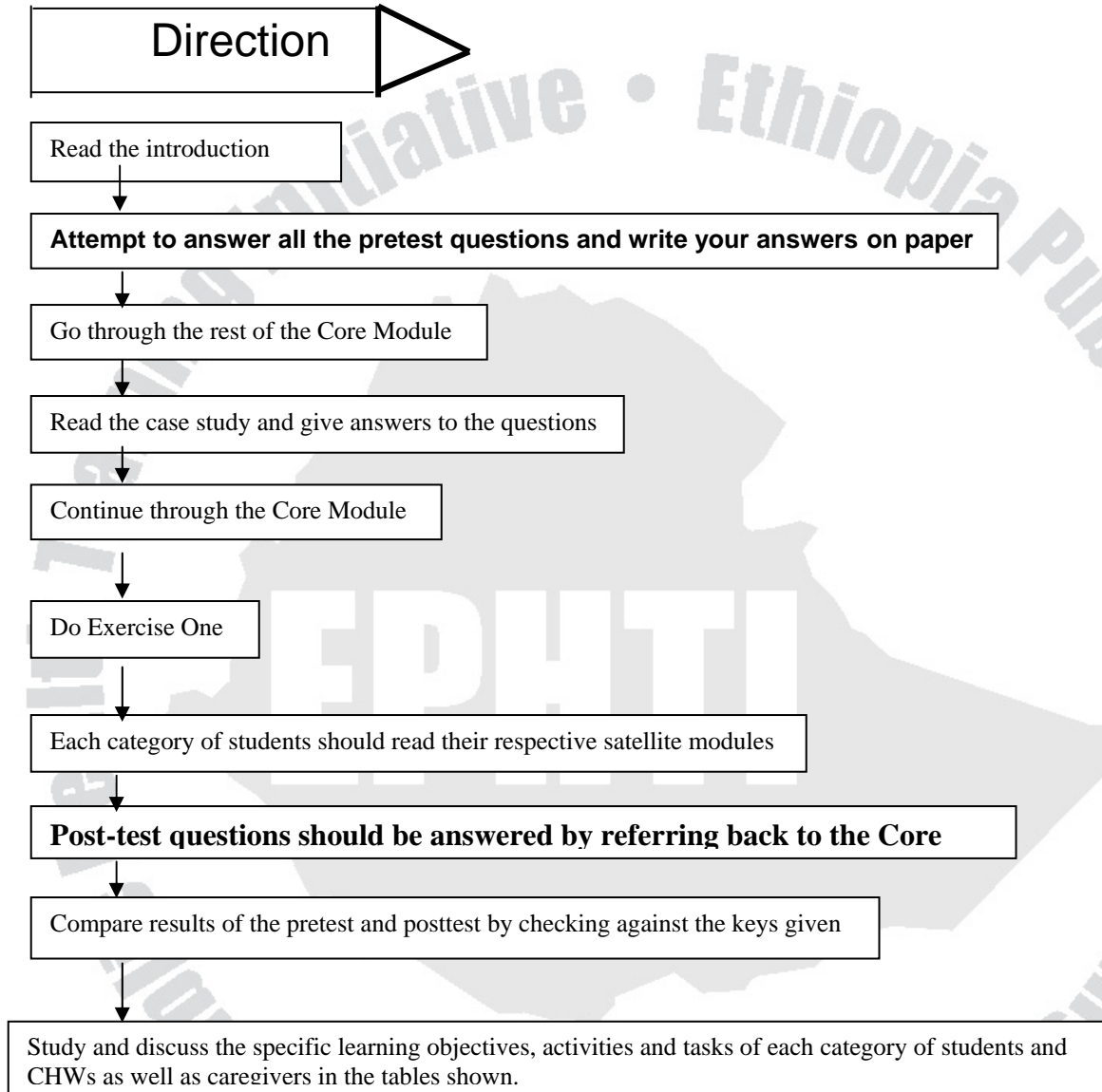
## 1.1 Purpose and Uses of the Module

This module is mainly prepared for Health Officer, Public Health Nurse, Environmental Health Technicians and Medical Laboratory Technology students. It may also be used by other categories of students. It serves as a practical guide to the management of pneumonia in under-five children of the Health Center level.

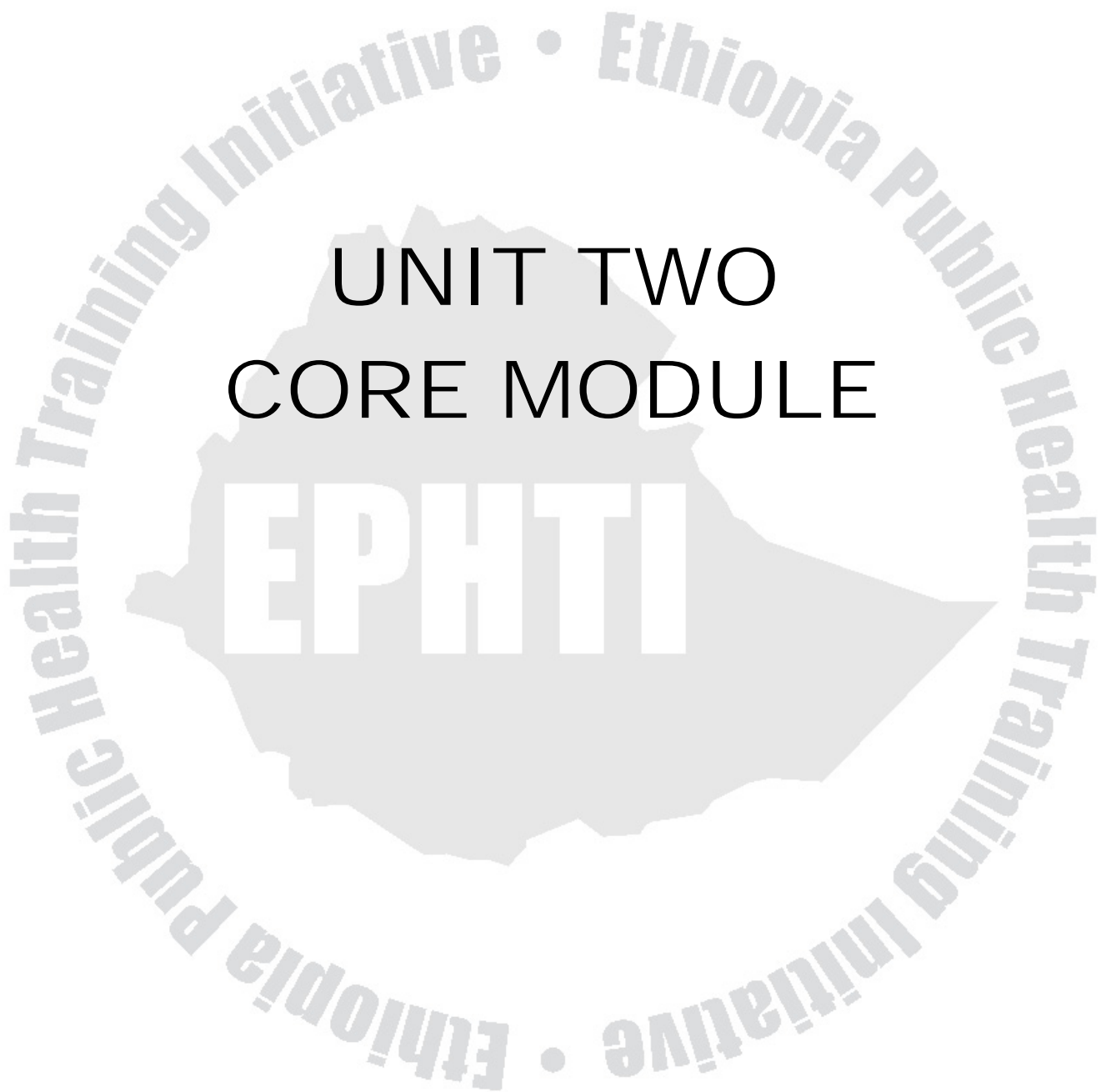
The module will help the students to work together as a team and to be able to appreciate the contributions that can be made by the team members and caretakers. The core module reflects general activities by all categories of students; and satellite modules emphasize the specific activities by each category of students.



## 1.2 Directions For Using The Module







UNIT TWO  
CORE MODULE

EPHTI

## 2.1 Pre-test

Instruction: Read the following questions and attempt to answer these questions.

### 2.1.1. Questions For All Categories

2.1.1.1 Which of the following are the predisposing factors for bacterial pneumonia in under-five children?

- a) Viral infection
- b) Malnutrition
- c) Poor ventilation
- d) Low socio-economic status
- e) All of the above

2.1.1.2 A 14 months old child with pneumonia present with the following symptoms and signs, except

- a) 30 breaths per minute
- b) Chest in-drawing
- c) Grunting
- d) Cough

2.1.1.3 Which of the following vaccine preventable diseases is frequently associated with pneumonia?

- a) Tetanus
- b) Tuberculosis
- c) Measles
- d) Pertussis
- e) 'c' and 'd'

- 2.1.1.4 Pneumonia is the most important killer respiratory disease in children.  
a) True      b) False
- 2.1.1.5 The most important measures to decrease death of children from pneumonia include  
a) Early diagnosis  
b) Prompt treatment  
c) Intensive investigation for the etiologic agent  
d) Admitting and treating every child  
e) 'a' and 'b'
- 2.1.1.6 The caregivers of the under-five children do not have a role in the treatment process of pneumonia.  
a) True      b) False
- 2.1.1.7 List two important clinical symptoms that can be recognized by the caregiver to diagnose pneumonia.  
1) \_\_\_\_\_  
2) \_\_\_\_\_
- 2.1.1.8 At a health center level the diagnosis of pneumonia largely depends on  
a) Laboratory investigations  
b) Chest X-ray findings  
c) Clinical features  
d) Waiting and observing the child for severe signs  
e) Consulting a physician

## 2.1.2. Questions For Health Officers

2.1.2.1 List four common bacterial causes of pneumonia in an under-five child.

1. \_\_\_\_\_.
2. \_\_\_\_\_.
3. \_\_\_\_\_.
4. \_\_\_\_\_.

2.1.2.2 Respiratory Syncytial virus is a common cause of viral pneumonia in older children above 5 years of age.

- a) True            b) False

2.1.2.3 Which of the following etiologic agents accounts for the majority of deaths from pneumonia?

- a) Staphylococcus aureus
- b) Streptococcus pneumoniae
- c) Hemophilus influenzae
- d) Adenoviruses
- e) 'b' and 'c'

2.1.2.4 Child 'X' is 4 years old. His mother has died recently. The child is diagnosed to have HIV/AIDS and has developed pneumonia. Which of the following is the most likely etiologic agent

- a) Klebsiella pneumoniae
- b) Streptococcus pyogenes
- c) S.pneumoniae
- d) H. influenzae
- e) 'c' and 'd'

2.1.2.5 Which of the following factor does not predispose to pneumonia?

- a) Measles
- b) Protein energy malnutrition
- c) Exposing a child to smoke
- d) Low birth weight
- e) Exposure to sunlight

2.1.2.6 Based on clinical symptoms, and signs clearly one can differentiate bacterial from viral pneumonia.

- a) True
- b) False

2.1.2.7 List two most important symptoms or signs that help the clinical diagnosis of pneumonia.

- 1) \_\_\_\_\_
- 2) \_\_\_\_\_

2.1.2.8 Which of the following is not included among the complications of pneumonia?

- a) Sepsis
- b) Empyema
- c) Meningitis
- d) Pneumothorax
- e) Cough

2.1.2.9 Write true or false for each of the following measures in prevention and control of pneumonia.

- a) \_\_\_\_\_ Early diagnosis and prompt treatment
- b) \_\_\_\_\_ Indiscriminate use of antibiotics

- c) \_\_\_\_\_ Immunization against measles and pertussis
- d) \_\_\_\_\_ Breast feeding

2.1.2.10 Which of the following antibiotics are used to treat a child with pneumonia?

- a) Amoxicillin
- b) Co-trimoxazole
- c) Gentamycin
- d) Tetracycline
- e) 'a' and 'b'

### 2.1.3 Questions For Public Health Nurses

2.1.3.1 In a child age 2 months up to 12 months, the child has fast breathing when his breathing rate is \_\_\_\_\_ times per minute or more.

- a) 30                      b) 60                      c) 50
- d) 40                      e) none

2.1.3.2 A cut of point for fast breathing in a young infant (<2 months) is more than \_\_\_\_\_ breaths per minute.

- a) 30                      b) 60                      c) 50
- d) 40                      e) none

2.1.3.3 Signs of respiratory distress include all, except

- a) Tachypnoea
- b) Subcostal retraction
- c) Fever
- d) Cynaosis
- e) Grunting

- 2.1.3.4 The nursing intervention for a child with pneumonia include all, except:
- a) Control fever
  - b) Check vital sign frequently
  - c) Maintain proper record
  - d) Administer drug properly
  - e) None of the above
- 2.1.3.5 During home visiting to a child with the diagnosis of pneumonia, the nurse assessment includes:
- a) Ventilation
  - b) Income of the family
  - c) Feeding practice of the family
  - d) Any febrile illness in the family
  - e) All of the above
- 2.1.3.6 In the planning stage of nursing process, the nurse accomplishment includes
- a) Setting priority
  - b) Identifying appropriate nursing measures
  - c) Setting objectives and goals
  - d) Establishing strategies
  - e) All of the above
- 2.1.3.7 During home visiting to control pneumonia, health education is given on
- a) Immunization
  - b) Weaning food
  - c) Well-baby clinic
  - d) Early medical help
  - e) All of the above

- 2.1.3.8 The three priority nursing diagnoses for a child with pneumonia based on ABC (Airway, Breathing, Circulation) are:
- Under-nutrition, hyperthermia and irritability
  - Inadequate airway clearance, ineffective breathing pattern and impaired gas exchange
  - Irritability, fluid volume deficit and impaired gas exchange
  - Fluid volume deficit, ineffective breathing pattern, under nutrition
- 2.1.3.9 While caring for a child with pneumonia, the role of the caregiver includes Provision of nutrition
- Provision of medication
  - Evaluating the child progress
  - Reporting unusual condition
  - All of the above
- 2.1.3.10 During home visiting, if you get young infant with cough or cold (no pneumonia), your advice to the mother doesn't include:
- Keep young infant warm
  - Limit breast feeding
  - Clear nose as necessary
  - Return quickly if breathing becomes difficult
- 2.1.3.11 Which one of the following are ways of checking the mother's understanding about prescribed antibiotic:
- Asking to repeat instructions
  - Asking to demonstrate what she heard
  - Asking about her plan to stick on the dosing schedule
  - Asking what problems she might have when giving the child antibiotic
  - All of the above



**Write True Or False For Each Statement**

- 2.1.3.12 \_\_\_\_\_ Culture and belief have no influence in control of pneumonia.
- 2.1.3.13 \_\_\_\_\_ Fever is uncommon in the first two months of life.
- 2.1.3.14 \_\_\_\_\_ Tea with sugar or honey is safe home remedy to soothe the throat and relieve the cough.
- 2.1.3.15 \_\_\_\_\_ A child who with fast breathing and chest in drawing, should be treated at home level.

**2.1.4 Questions For Environmental Health Technicians**

- 2.1.4.1 Which of the following statements is a predisposing factor for pneumonia in under-five children
- a) Poverty
  - b) Malnutrition
  - c) Not being immunized
  - d) In-door air pollution
  - e) All of the above
- 2.1.4.2 In prevention and control of pneumonia, social mobilization of the community is more practical to
- a) Improve housing conditions and ventilation
  - b) Increase immunization coverage in the catchment area
  - c) Make early diagnosis
  - d) Practice breast feeding and weaning

- 2.1.4.3 Which of the following interventions is not applied to susceptible host
- a) Prompt treatment
  - b) Immunization
  - c) Health education
  - d) Improving ventilation
- 2.1.4.4 Which of the following statement is not true about improved ventilation?
- a) Proper house construction
  - b) Opening windows and doors
  - c) Proper arrangements of house furniture
  - d) Cross ventilation is better than through ventilation
- 2.1.4.5 Which of the following is not a health promotion and prevention strategy with regard to pneumonia?
- a) Proper ventilation
  - b) Proper nutrition
  - c) Immunization
  - d) Treatment
- 2.1.4.6 Which types of EPI vaccines directly contribute to the prevention of Pneumonia?
- 1) \_\_\_\_\_ 2) \_\_\_\_\_
- 2.1.4.7 List at least three most important preventive and control measures of Pneumonia.
- 2.1.4.8 Which of the following statements is not a practical objective of an environmental health technician with respect to pneumonia?
- a) Help early diagnosis
  - b) Increase immunization coverage in the catchment area

- c) Improve housing condition and ventilation
- d) Treat pneumonia

## 2.1.5 Questions For Medical Laboratory Technicians

2.1.5.1 What are the main laboratory tests that assist for the diagnosis of pneumonia?

2.1.5.2 Using an old solution of iodine can be the cause of false negative result in gram staining technique.

- a) True
- b) False

2.1.5.3 Which of the following are the major reasons for false negative results in gram reaction?

- a) Old culture smear preparation
- b) Cell wall-acting antibiotic therapy
- c) Excessive heat fixation
- d) Over decolorization of the smear
- e) All of the above

2.1.5.4 Arrange chemical reagents according to order of gram staining procedure

- a) Crystal violet – gram's iodine – acetone alcohol - safranin
- b) Gram's iodine – crystal violet – safranin – acetone alcohol
- c) Acetone alcohol – Gram's iodine – crystal violet - safranin
- d) Safranin – acetone alcohol – Gram's iodine – crystal violet

2.1.5.5 Which of the following are indicators of purulent respiratory secretion?

- a) >25 neutrophils/LPF and <10 squamous epithelial cells/LPF
- b) <25 neutrophils/LPF and >10 squamous epithelial cells/LPF

- c) >25 neutrophils/LPF only
- d) Presence of mucus in the sputum

2.1.5.6 The decolorizing agent for gram staining technique is

- a) Safranin
- b) Acid-alcohol
- c) Acetone-alcohol
- d) Crystal violet

2.1.5.7 The mordant agent in gram-staining technique is

- a) Acid-alcohol
- b) Safranin
- c) Gram's iodine
- d) Diluted carbol-fuchsin

2.1.5.8 Which of the following correctly describes the microscopic appearance of *Streptococcus pneumoniae*?

- a) Gram positive lancet – shaped diplococci
- b) Gram positive cocci in chains
- c) Gram negative diplococci
- d) Gram negative cocci in chains
- e) Gram positive cocci in clusters

## 2.2 Significance And Brief Description On Pneumonia

Pneumonia is among the major killer diseases in under-five children. In developing countries 3 million children die each year due to pneumonia. The main causes of pneumonia are infectious agents such as microorganisms. In some cases, noninfectious agents can also cause pneumonia. For example, aspiration of food, chemicals such as hydrocarbons, and inhalation of smoke can cause pneumonia.

In this module, the emphasis is on the commonest *infectious causes of pneumonia*.

If pneumonia is diagnosed and treated early and appropriately, *morbidity and mortality in under-five children can be reduced significantly*.

## 2.3 Learning Objectives

### **After Completion Of The Activities, You Will Be Able To:**

1. *Identify and name the different preventive and control measures for pneumonia in under-five children.*
2. *Describe the causative agents.  
Identify the risk factors of pneumonia.*
3. *Describe the clinical picture of pneumonia.*
4. *Make appropriate diagnosis of pneumonia.*
5. *Identify the contribution that can be made by caregivers and community health workers in the management of pneumonia.*
6. *Treat pneumonia based on recommended and standard procedures.*
7. *Increase the awareness of communities about pneumonia through health education.*
8. *Understand and identify the tasks and role played by each category of trainees in the management of pneumonia.*

## 2.4 Case Study: Learning Activity 1

***Study The Case Presented Below Carefully And Discuss Among Yourselfs. The Discussion Should Preferably Be Made In A Group Of Six To Eight Students.***

Senait Berhanu is a ten months old female infant. Two days back she started to have running nose, irritability and cough. She then developed fast breathing and high-grade fever. For these problems she was taken to a nearby private clinic where she was treated with unspecified injection and syrup. However, although the fever looked subsided, there was no improvement in her general condition. Later on, Senait started grunting and breathing became more difficult. Her cough became frequent and severe. She also refused to breast-feed and take food. The mother became worried and took her to Gondar Health Center.

***Based On The Case Study Given Above, Try To Answer The Following Questions.***

1. *What is the most likely problem of Senait?*
2. *Give your reasons for the diagnosis you have suggested?*
3. *What factors could have predisposed the Senait to acquire the above problem?*
4. *What questions would you like to ask the mother further?*
5. *Who is responsible to treat Senait?*
6. *Do you think it is a life threatening condition? Why?*

## 2.5 Definition

Pneumonia is an inflammation of lung tissue including alveolar spaces and interstitial tissue.

## 2.6 Epidemiology

### Global

According to different reports, in developing countries, a child dies every seven seconds from Acute Respiratory infections (ARI) usually pneumonia.

### Ethiopia

ARI were reported to be among the leading causes of under-five mortality accounting for 40% of hospital admissions and a third of the deaths in children. The Case Fatality Rate (CFR) in Addis Ababa was 14.7%, which is slightly greater than the highest rate reported in other developing countries. Based on the report of the MOH, pneumonia was the 4<sup>th</sup> leading cause of morbidity in infants (MOH, 1994/95).

## **Predisposing (Risk) Factors**

1. *Malnutrition, including Protein Energy Malnutrition (PEM), hypovitaminosis A, iron deficiency and rickets*
2. *Inadequate breast-feeding and not breast-feeding*
3. *Unimmunized child (low immunization coverage)*
4. *Low level of education of caregiver*
5. *Low birth weight*
6. *Viral infections*
7. *Over crowding and poor ventilation*
8. *Indoor - air pollution, such as from use of bio-mass fuel (fire wood, charcoal) and cigarette smoking*
9. *Immuno-deficiency states specially HIV/AIDS*
10. *Low socio-economic status*

## **2.7 Etiology And Pathogenesis**

### **2.7.1. Etiology**

Bacteria and viruses are the most important and common causes of pneumonia in children.

#### **I) Viral – Major Cause In Developed Nations**

The major viral causes are:

1. Respiratory Syncytial Virus (RSV) – common during infancy
2. Adenoviruses
3. Parainfluenza viruses
4. Influenza A and B viruses



## **II) Bacterial**

In developing countries bacteria are major causes of pneumonia in children. The most common causes of bacterial pneumonia in under-five children include:

1. Streptococcus pneumoniae
2. Haemophilus influenzae
3. Streptococcus pyogenes
4. Staphylococcus aureus

### **2.7.2 Pathogenesis**

The microorganisms (germs) enter through the respiratory route by inhalation or aspiration. The organisms reach bronchioles and proliferate (multiply). Inflammation occurs in alveolar spaces. Pathological changes depend on the type of organism, the age and the condition of the host/ patient.

### **2.8 Clinical Features**

The clinical presentation and severity of pneumonia differ depending on the type of the causative agent, infective dose, age, nutritional and immunity status of the host.

#### **Viral Pneumonia**

It is commonly a mild and self-limiting disease manifesting with previous history of Upper Respiratory Tract Infection. The illness starts with respiratory symptoms such as running nose and cough. The child may have:

1. Low grade fever or no fever
2. Mild cough

3. Moderate tachypnoea or no tachypnoea
4. Rarely becomes severe with evidence of respiratory distress (tachypnoea, chest indrawing, grunting, flaring of the nose, cyanosis, and respiratory fatigue).

## Bacterial Pneumonia

Bacterial pneumonia may follow and complicate viral respiratory infections. The clinical presentations are different in older children, infants, and small children. It also varies according to the specific infectious agents.

**Note:** it is often difficult to differentiate viral causes from bacterial causes based on the clinical presentations alone.

### *In older children (>5years)*

The presentation resembles that of adults. Onset chills, rigor, high-grade fever followed by chest pain and cough. In severe cases cyanosis may occur. Tachypnea, grunting, nasal flaring, and retractions of the intercostal, subcostal and supraclavicular areas are the most important physical findings.

### *In infants and small children (<5 years)*

The disease may follow mild respiratory tract infections such as stuffy nose, diminished appetite. Then, fever and respiratory distress may follow. Infants less than two months may have different clinical presentations.

### **Main Symptoms And Signs Of Pneumonia**

1. Cough
2. Chest in-drawing\*
3. Difficult breathing
4. Increased respiratory rate\*
5. Cyanosis (in very severe cases)

\* = Most important for the diagnosis of pneumonia

### **Non- Specific, General Danger Signs Of Pneumonia**

1. Vomiting everything
2. Convulsions
3. Lethargy or unconsciousness (abnormally sleepy)
4. Failure to eat or drink

### **Complications**

**Depending On The Type Of The Organism, Immunity Status And Age Of The Child The Following Complications Could Occur**

1. Overwhelming sepsis and septic shock;
2. Extra pulmonary infections;
  - Arthritis
  - Osteomyelitis
  - Myocarditis and pericarditis
3. Meningitis
4. Empyema
5. Pneumothorax
6. Respiratory failure

**Note:** For additional information read textbooks of pediatrics.

## 2.9 Diagnosis

The diagnosis of pneumonia is basically on clinical grounds. This is because most health institutions do not have the facilities to isolate and identify the causative agents. Some of the laboratory investigations are not specific to the disease.

### ***The Diagnosis Is Based On:***

- A) Symptoms and signs
- B) Laboratory Procedures

Blood film examination can be performed to rule out blood parasites such as malaria. Note that co-infection with malaria is common in endemic areas.

**Note:** *Chest x-ray may be helpful if facilities are available.*

## 2.10 Case management

Assess and manage the child based on Integrated Management of Childhood Illnesses flowchart (copied from UNICEF modules).

See the management flowchart (Annex I).

## 2.11 Prevention And Control

1. Early diagnosis that should start at home through improvement of care-seeking behavior of mothers
2. Case management (early diagnosis and early treatment)
3. Breast feeding
4. Appropriate weaning practice after 4 to 6 months of age
5. Immunization (measles and pertussis)
6. Health education about danger signs of severe pneumonia to mother and CHWs
7. Vitamin A supplementation

8. Minimize exposure to smoke
9. Separate living rooms from kitchen
10. Improve the type of stoves used to decrease the amount of smoke released in the house
11. Adequate exposure to sunlight
12. Proper ventilation

## Health Education

- Emphasize on nutritional advice and weaning initiation and breast feeding
- Discourage parental smoking
- Teach caregivers on the danger of smoke in house
  - Caregivers should keep away children from smoke
  - Ventilate living rooms by opening doors and windows
  - Separate kitchen from the living room
  - Explain about the advantage of using stoves with less smoke
- Advice on immunization especially against measles & pertussis
- Vitamin A supplementation
- The need for early recognition of symptoms and visit to health institutions or a CHW
- Provision of drugs and care as prescribed by health professionals
- The importance of exposing infants to sunlight to help the synthesis of Vitamin D in the body

### ***Discuss About The Following In Your Group***

- 1. Write three important points that you would like to teach on pneumonia?*
- 2. What teaching methods would you like to use?*
- 3. Where do you like to teach? At home, at health institutions, etc.*
- 4. How could you cover the target population?*
- 5. How could you evaluate the outcome of the health education?*

## 2.12 Group Exercise: Learning Activity 2

Read the following instructions to do the exercises on prevention & control measures of pneumonia

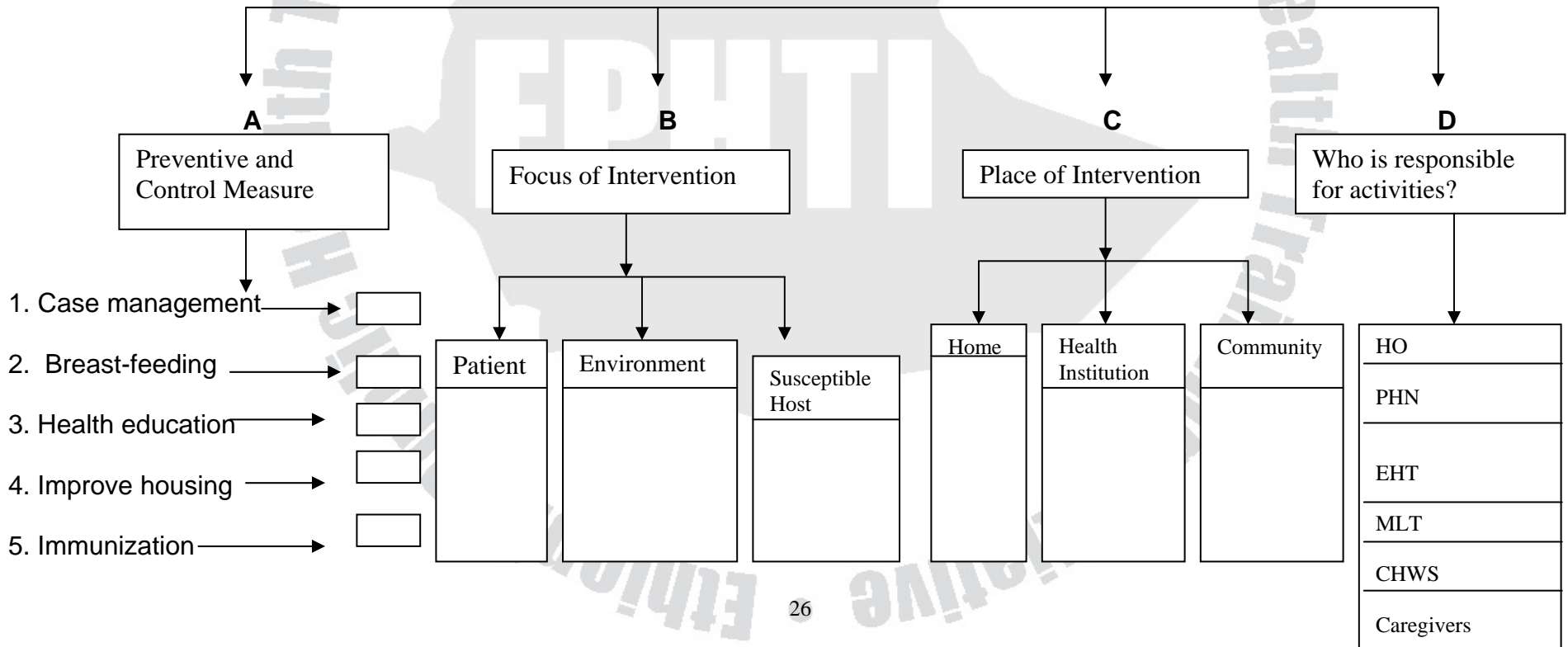
1. **Divide** yourselves into five subgroups of six to eight students;
2. Study and discuss on the flowchart of pneumonia, prevention and control **Part One and Two**;
3. **Part One** includes: **A** - preventive and control measure, **B** - Focus of intervention, **C** - Place of intervention, and **D** – Responsibility. **Part Two** activities are listed (**A, B, C, and D**).
4. **Match** part **I A** by selecting activities from part **II A**, part **I B** to part **II B**, part **I C** to part **II C**, and part **I D** to part **II D**.
5. **Present** your answers to the whole group and discuss.

The exercise could be done by posting the two parts on the wall and writing the corresponding numbers from Part Two on the space provided on Part One using the same procedures as mentioned in the above.

The whole exercise should not take more than one hour and fifteen minutes.

# Part I

## EXERCISE ON PREVENTIVE AND CONTROL MEASURES OF PNEUMONIA



## Part-II

**A**

- A:1. Natural immunity
- A:2. How to keep food & food utensils clean
- A:3. Early diagnosis
- A:4. Prevent measles & Pertussis
- A:5. Early treatment
- A:6. Reduce overcrowding
- A:7. Separate kitchen

**B**

- B:1. Vitamin A supplementation
- B:2. Immunization
- B:3. Early diagnosis
- B:4. Prompt Treatment
- B:5. Health education
- B:6. Improve ventilation
- B:7. Reduce overcrowding

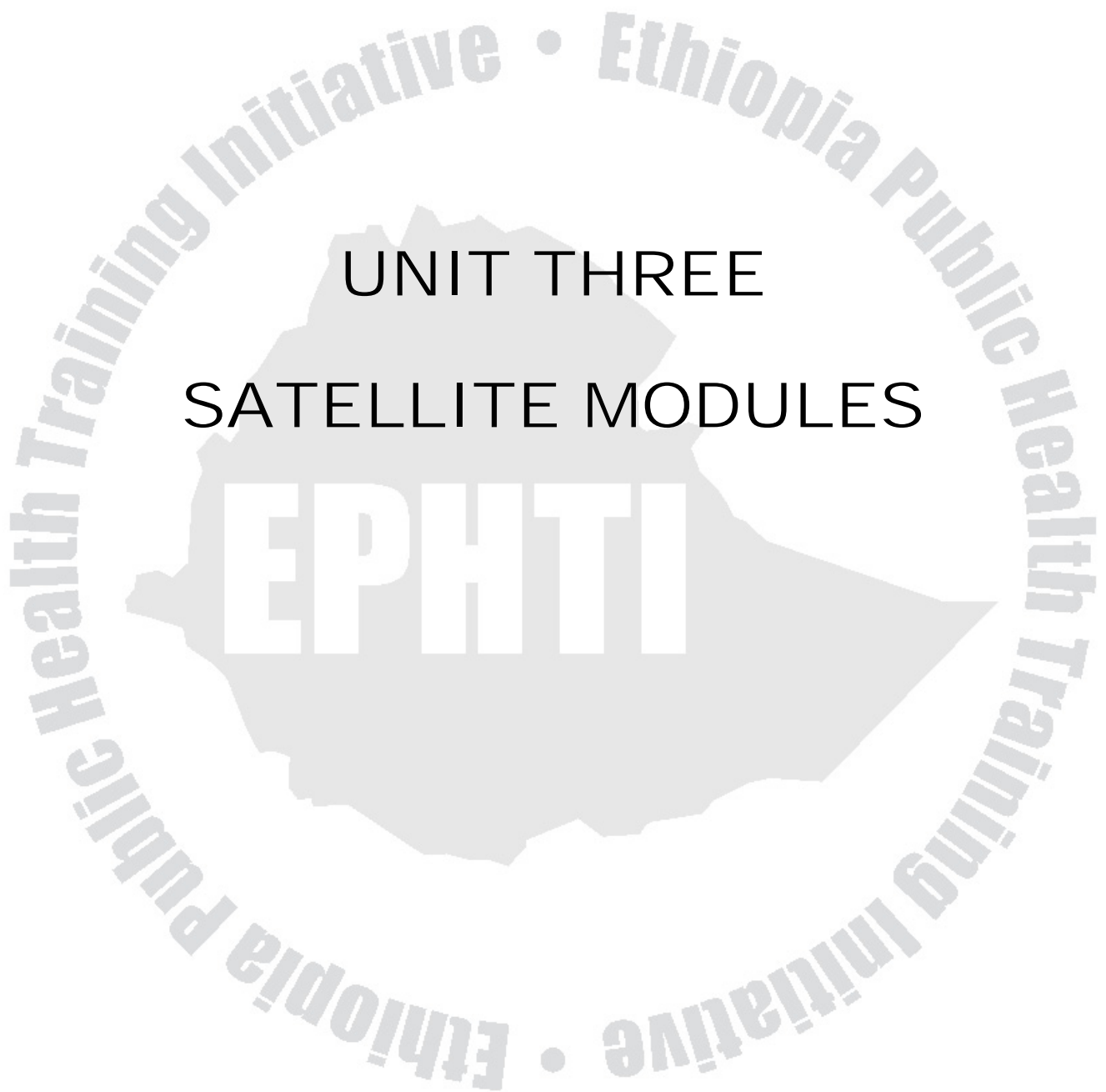
**C**

- C:1. Immunization
- C:2. Vitamin A supplementation
- C:3. Danger sign recognition
- C:4. Breast feeding
- C:5. Treatment
- C:6. Diagnosis
- C:7. Health education

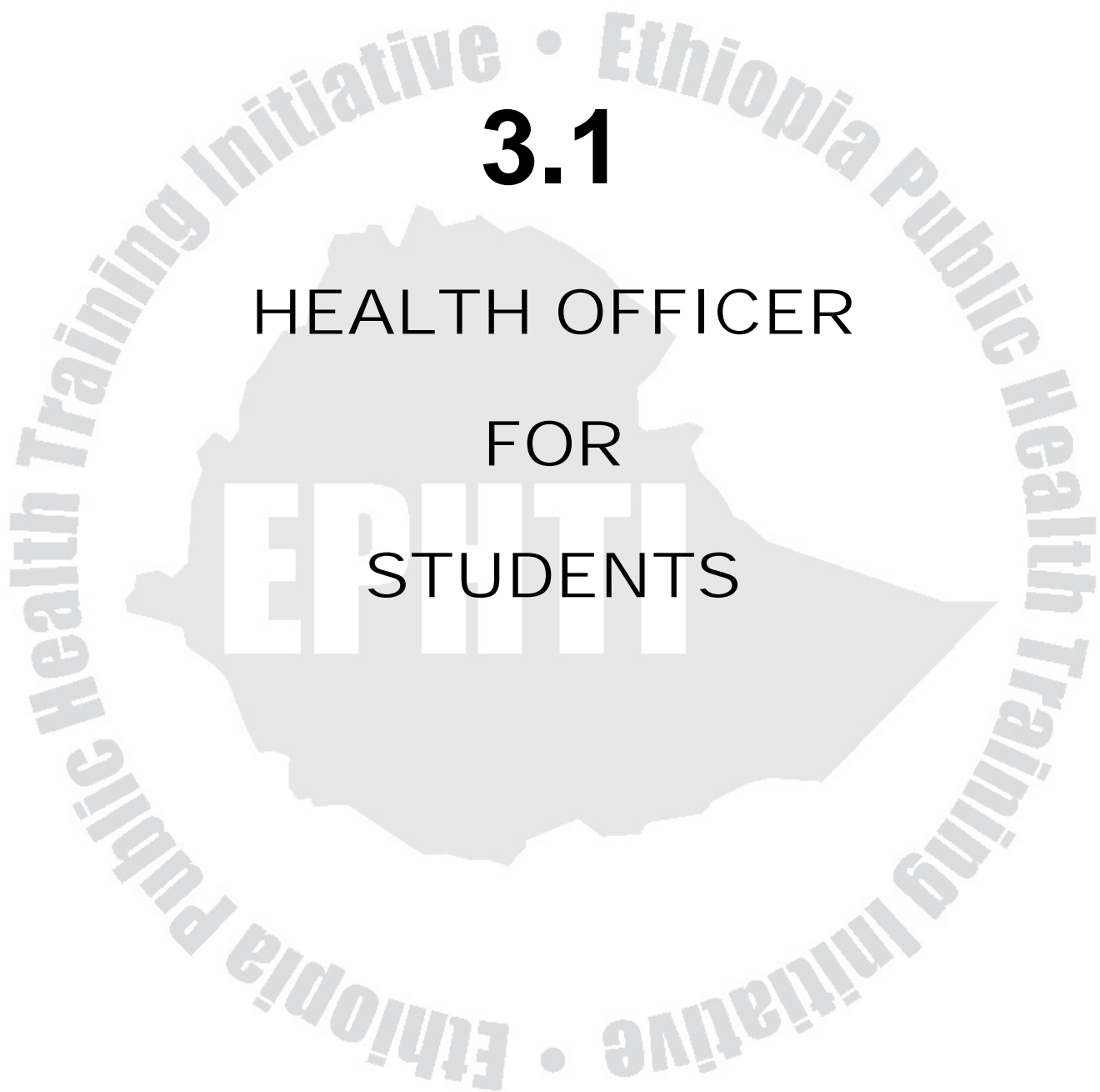
**D**

- D:1. Mobilize community
- D:2. Vaccinating children
- D:3. Practice breast feeding
- D:4. Give health education
- D:5. Treatment with drugs
- D:6. Making proper diagnosis
- D:7. Demonstrating how to improve ventilation





UNIT THREE  
SATELLITE MODULES



# 3.1

HEALTH OFFICER

FOR

STUDENTS

## **1.0 INTRODUCTION**

### **1.1 Purpose**

This satellite module is prepared for health officer students. The module emphasizes only specific areas that were not covered by the Core Module.

### **1.2 Instructions For Using The Satellite Module**

Students must study the Core Module before going to the satellite module. It is also advisable to refer to the Core Module wherever indicated. The health officer students may also study the satellite module prepared for laboratory technician students.

### **1.3 Learning Objectives**

*At the end of the session you will be able to:*

1. Appreciate the burden of deaths that is attributed to pneumonia in under-five children
2. Develop the skill of diagnosing pneumonia.
3. Describe the management of pneumonia.
4. List the complications of pneumonia.

## 1.4 Case study: learning activity 1

***Upon further inquiry into the history of Senait the following information was extracted.***

Her mother is alive and well. There is no family history of bronchial asthma or allergic skin lesion. No history of contact with a known tuberculosis patient. She is not from malarious area nor has history of recent travel to malarious area. There is no history of skin rash or pain during urination. There is no history of ear pain or discharge. History of diarrhea and vomiting is not present.

She is fully immunized for her age and has received vitamin A capsules recently. She was exclusively breast fed for four months and weaning food was introduced at four months of age. She is able to transfer objects from hand to hand and say "baba" and "mama". She has started to crawl recently. She is the third child for the family. Her pre and post- natal history was uneventful. Both parents are teachers, and are healthy.

### **Questions**

1. State why the history included statements about asthma, tuberculosis, skin rash, malaria, ear problem, and urinary symptoms?
2. What is the importance of knowing the status of vaccination and vitamin A supplementation particularly in pneumonia?
3. Explain why the antenatal, delivery postnatal, and developmental history are included?
4. What do you need to classify the disease?
5. What are the first things you do during your observation?

**When Senait was examined the following was observed**

She is well nourished but acutely sick looking and in respiratory difficulty. In addition she was grunting with flaring of nostrils. Breathing is difficult and there is inter-costal and sub-costal retraction of the muscles.

***Vital Signs***

Body temperature = 39.5°C (rectal)

Respiratory Rate = 60/minute

***Anthropometry***

Weight = 10kg

Length = 70 cm

Head circumference = 38cm

***On examination of the Head, Eye, Ear, Nose and Throat***

- No yellowish discoloration of the sclerae
- No discharge seen in the outer ear canal
- The ear membrane are shiny to light reflex and don't bulge
- The tongue and oral mucosa are mildly dry

***Chest***

**Inspection**

- There is chest indrawing and flaring of the nostrils
- There is no gross deformity of the chest

**Palpation** - there is no abnormal finding

**Percussion** - chest was resonant to percussion all over

**Auscultation** - coarse crepitations heard all over the lung fields

***Abdomen***

- It is soft and there is no enlargement of the spleen or liver

***Musculo-skeletal system***

- There is no bone deformity or tenderness of the spine

***Integumentary system***

- There are no skin rashes

***Central nervous system***

- The child is alert but irritable
- The neck is not stiff

**Based on the above findings, answer the following questions**

1. *What are the most important physical findings that help you to make the diagnosis?*
2. *What was the reason for making a systematic physical examination?*
3. *Do you think it is a severe disease? Yes\_\_\_\_\_ No\_\_\_\_\_*
4. *What criteria have you used to say “yes” or “no” to question number 4?*
5. *What actions would you take to manage the case?*
6. *What role could the mother play during the management of her child’s problem?*
7. *List the preventive actions that should have been taken to protect the child from developing the disease or its complications.*

## **1.5 Etiology**

Besides the major causes of pneumonia as mentioned in the Core module, there are other causes depending on the age, immune and nutritional status of the child.

**For example,**

### **a) Neonates**

- Gram negative enteric Bacilli – Escherichia coli
- Group B streptococcus (streptococcus agalactae) (important pathogen in developed countries)

### **b) Immuno-compromised (children with HIV/AIDS)**

- Pneumocystis carinii
- Tuberculosis
- Staphylococcus aureus

- Gram negative bacteria such as Klebsiella and Pseudomonas

**c) Protein Energy Malnutrition**

- Gram negatives such as Pseudomonas and Klebsiella
- Staphylococcus aureus
- Tuberculosis

## 1.6. Clinical Features

### ***Viral pneumonia***

Pneumonia of viral origin often follows upper respiratory tract symptoms such as coryza, running nose and cough. Usually there are other family members with respiratory tract infections. In some occasions viral pneumonia may be complicated by superimposed bacterial pneumonia. Pneumonia from viral infections is common during the “cold weather”.

The clinical symptoms are similar to bacterial pneumonia (see the Core Module). It is often difficult to differentiate viral pneumonia from bacterial pneumonia based on clinical feature only.

### ***Bacterial pneumonia***

- The majority of deaths in under-five children are attributed to *Streptococcus pneumoniae* and *Hemophilus influenzae type b*.
- Bacterial pneumonia usually occurs following viral infections of the respiratory system.

## 1.7. Epidemiology

In developing countries, acute lower respiratory infections account for 19% of all deaths in under-five children and 8.2% of all disability occurring in the under-fives. In developing countries three million children die each year.

## 1.8. Diagnosis

1. Assessment: history and physical examination (see Core Module)
2. Laboratory investigations contribute very little to the diagnosis

### Viral

*The non specific laboratory tests (ESR, WBC) are nonspecific and have minimum contribution for the diagnosis of viral pneumonia.*

### Prognosis

Most previously well children with viral pneumonia will recover. Infants may develop some complications. RSV characterized by thick tenacious secretions, hacking cough, and irritability. Unless treated cautiously, may lead to complications.

### Bacterial

History and physical examination

1. The non-specific laboratory tests (ESR, WBC) do not help to differentiate bacterial from viral pneumonia.
2. Chest X-ray (if available). If asthma is prevalent chest x-ray should be avoided unless there is strong suspicion of pneumonia.



## 1.9 Case Management

Study the pneumonia management flowchart (Annex I).

## 1.10 Prevention and control

In addition to what is listed in the core module, immunization against *Streptococcus pneumoniae* and *Hemophilus influenzae type b* is a possibility in developing countries in the future. Vaccine against *Hemophilus influenzae type b* is already in practice in the developed world.

## 1.11 Case Study: Learning Activity 2

Read the following case study carefully and discuss the questions given below.

Gezahegn Alemu is a two and half year old child. Five days' back the child experienced high-grade fever, which happened suddenly. The fever was followed by cough. The mother was worried since the child was very hot and refused to take food. She tried a local herb treatment to soothe the fever. Unlike the other times, her child's condition did not improve. Two days later, the breathing became difficult with the gaping nostrils and abnormal movement of the chest. His breaths were short and fast as compared to the previous couple of days. His tongue and mouth became dry and showed cracks at the angles.

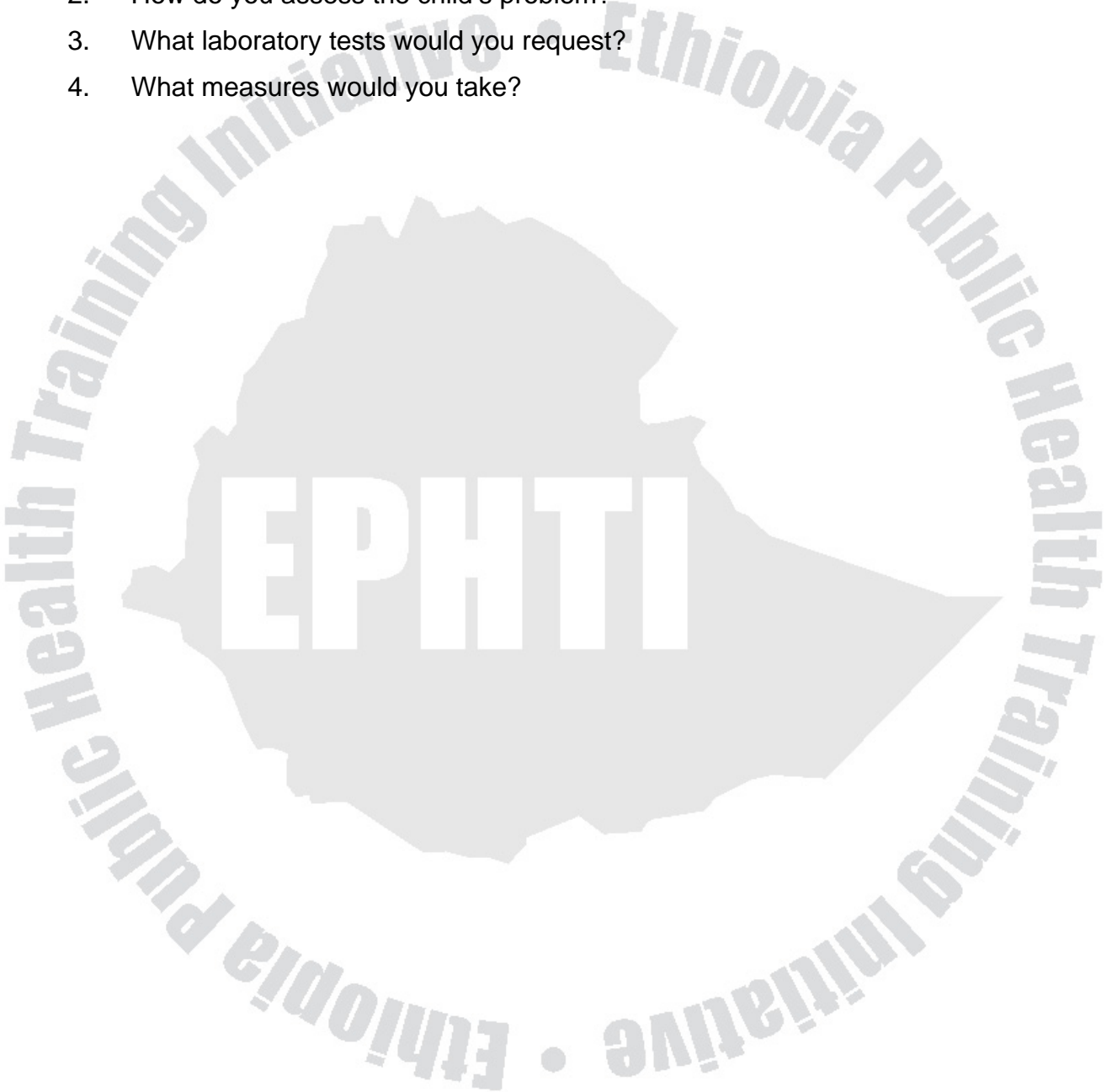
Initially the child was crying now and then but later on he became weak. A local healer was consulted and brought to the house. He examined the child and reassured the parents. He ordered the family to kill a black chicken and prepare two uncooked eggs to leave outside by the roadside. He also tied some medicine around the child's left arm and told the parents that the problem was caused by evil eye (Buda).

The mother expected that her child would be better. However, after all these efforts, the condition of the child deteriorated. The next day, his condition was even worse. A neighbor advised the mother to take the child to Kolla Diba health center (Hakimbet) which is located about 4 hours walking distance from the village. She brought the child to the health center.

Assume that you are the health officer of the health center who is in charge.

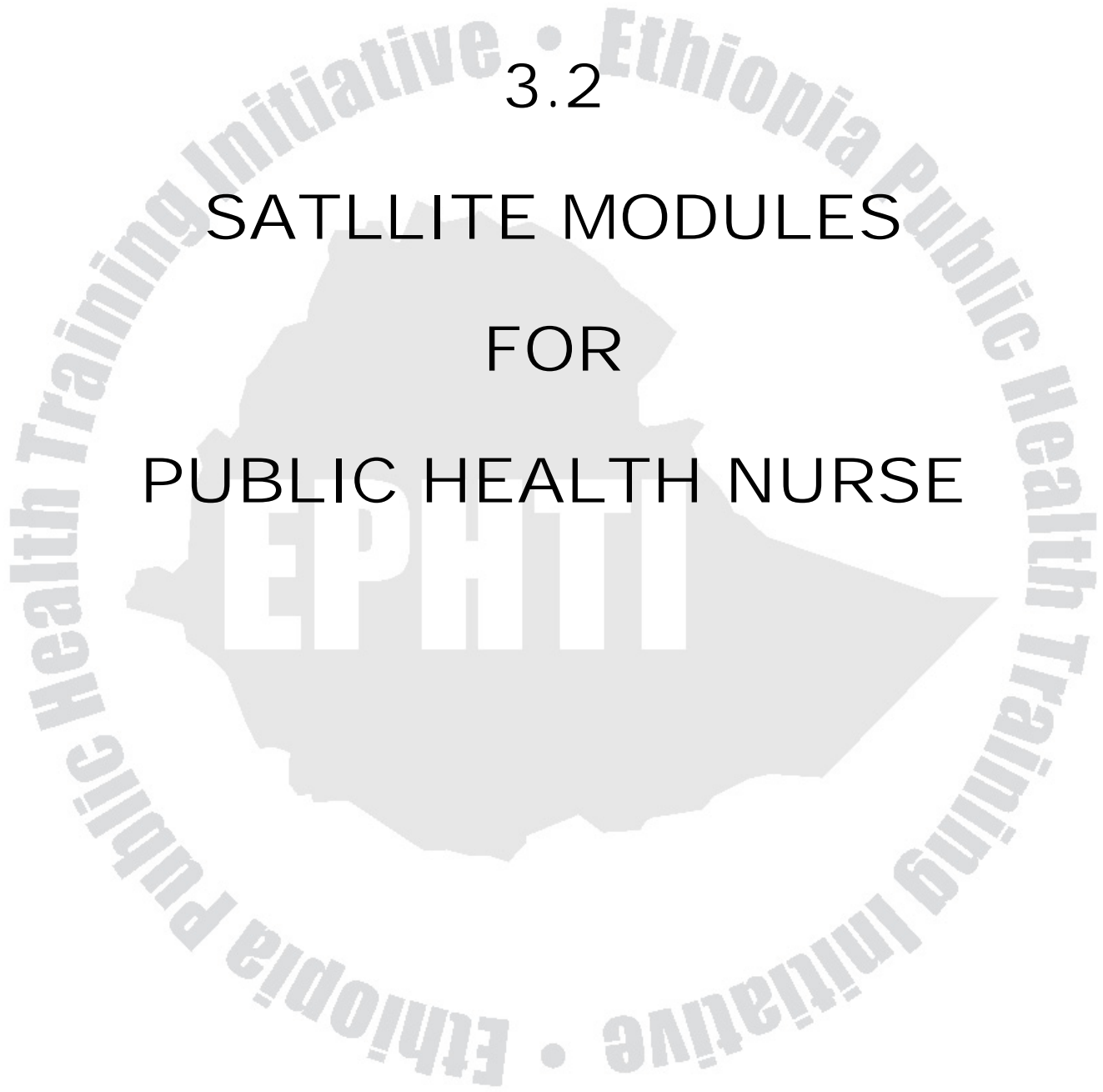
## **Questions**

1. List the questions that you would like to ask the mother.
2. How do you assess the child's problem?
3. What laboratory tests would you request?
4. What measures would you take?



3.2

SATLLITE MODULES  
FOR  
PUBLIC HEALTH NURSE



# 1.0 INTRODUCTION

## 1.1 Purpose

This satellite module is prepared for public health nurse students to help them manage, control and prevent pneumonia in under-five children effectively.

## 1.2 Instructions

Students must read the Core Module before going into the satellite module. They are also advised to refer to the Core Module wherever indicated.

## 1.3 Learning Objectives

***Upon completion of the satellite module you will be able to:***

1. State individual and family focused nursing diagnosis of a child with pneumonia.
2. Mention the methods used to assess and evaluate pneumonia in an under-five child.
3. Describe the activities in planning to manage a child with pneumonia.
4. Mention nursing interventions to treat, prevent or control pneumonia at a health center setting.
5. Describe ways of evaluating the nursing care provided to a child with pneumonia and to the family.

## 1.4 Nursing Assessment

- Take adequate history from the caregiver
- Observe the child for flaring of the nostrils and chest in-drawing(retraction).

- Check weight for age

## 1.5 Nursing Diagnosis

- Inadequate airway clearance.
- Ineffective breathing pattern.
- Impaired gas exchange.
- Fluid volume deficit.
- Under-nutrition.
- Hyperthermia or sometimes hypothermia.
- Weak child (limited activity for age).
- Irritability and abnormal crying.

## 1.6. Nursing Plan

1. Give priority for life treating condition.  
(ABC: Airway, Breathing and Circulation).
2. Identify activities to treat the above conditions (ABC).
3. List down the expected outcome with time limit against which evaluation can be made.

## 1.7. Nursing Intervention

1. Check vital signs frequently (Respiration Rate, Axillary Temperature, every hourly) and record.
2. Encourage fluid intake.
3. Control the fever:
  - Reduce extra bedding
  - Ventilate the room

- Give antipyretics
- 4. Encourage mother to breast-feed the child.
- 5. If the child has already started weaning, assist and teach the mother to continue feeding.
- 6. Decrease unnecessary physical activities to minimize extra energy expenditure.
- 7. Involve the family in the management of pneumonia such as child feeding, consultation of health professionals, and provision of medications as prescribed.
- 8. Administer the drug properly.
- 9. Record vital signs, drugs administered and fluid given.

## 1.8 Evaluation

1. Are the respiratory rate and temperature within the normal range?
2. Are there signs of respiratory distress?
3. Is the child playing, communicating or restless?
4. Is the child breast-feeding, taking weaning foods and / or fluids?
5. Is the caregiver actively involved in the management of the child?
  - In providing medication
  - Breast-feeding
  - Insuring good hydration
  - Seeking help from health worker as needed

If the above questions are answered negatively, go back through all the steps again checking where the problems lie.

## 1.9 Discharge planning

Plan a home visit to follow the child after discharge (if possible)

- Write down the name of household head, address (“kebele” and house number)

- Note a landmark for the location of the house, it will be helpful to you in case you miss the direction
- Make an appointment and plan home visit with family
- 

## **1.10. Nursing Process At Home Level**

### **1.10.1. Establish rapport**

#### **1.10.1.1 Assess:**

1. The presence of similar or febrile illness in the family
2. Culture and beliefs of the family related to pneumonia
3. The traditional treatment and supportive health practices for pneumonia
4. Nutritional status of the mother
5. Availability, preparation and feeding practice
6. Immunization status (check the immunization card)
7. Ventilation of the house
8. Weight of the children under one
9. Educational status of the family
10. Income of the family
11. Mortality & survival of other children
12. Review road to health chart

#### **1.10.1.2 *Identify The Most Important Problems Of The Family (Family Focused Nursing Diagnosis)***

#### **1.10.1.3 *Set your objectives and prioritize the problems*** ***Identify the nursing measures to address the problem***

#### **1.10.1.4 *Nursing intervention***

##### ***Provide health education on:***

- Immunization

- Pneumonia: how it is caused, danger signs, importance of early treatment and visit to health workers
- Feeding of children especially breast feeding
- Ventilation
- Growth monitoring (weight for age)

### 1.11 Methods

- Demonstration weaning food preparation, proper ventilation, etc.
- Health talks and discussions

### 1.12 Evaluation

- Check whether caregiver and family have understood what you have talked about or demonstrated through observation, asking questions and by inviting them to re-demonstrate

#### NOTE

Plan to re-visit the home. E.g. check whether the medications are taken based on the recommendations and how much the caregiver has cooperated with the advice given.

Keep a good record (family folder card).

### 1.13 Case Study: Learning Activity - 1

A six-month-old child who admitted to your health center with a diagnosis of pneumonia was discharged improved after four days. You plan to make a home visit and make an appointment. He is the youngest and the 6<sup>th</sup> child of the family. The 4<sup>th</sup> and 5<sup>th</sup> children are two years and four years old respectively. You are told the two-year old child is unable to walk. All children are not immunized. The mother is not literate. Mother claims to start weaning at one year of age for her children. You found her cooking food for the family while carrying her 6<sup>th</sup> months old infant. There is no partition of the room. The husband is a farmer and supports the family by harvesting from a small plot of land.



## Exercise

1. Identify all factors in the family that predispose the children to pneumonia.
2. List down the family focused nursing diagnoses related to pneumonia.
3. Identify the plan for each of the nursing diagnoses you have mentioned.
4. Describe the nursing interventions and how you evaluate them.



3.3

SATELLITE MODULE  
FOR  
ENVIRONMENTAL HEALTH  
TECHNICIANS STUDENTS

**EPHTI**

# 1.0 INTRODUCTION

## 1.1. Purpose and Use of the Satellite Module

This satellite module is prepared for environmental health technician (sanitarian) students. The satellite module emphasizes only areas that are specific to sanitarian students and not covered by the Core Module.

## 1.2 Instructions

Students must study the Core Module before going into the satellite module. They are also advised to refer to the Core Module whenever indicated.

## 1.3. Learning Objectives

*At the end of the session you will be able to:*

1. Identify the importance and the technical aspect of improving ventilation in the living quarters & kindergarten.
2. Increase the awareness of communities about pneumonia through health education
3. Understand and practice the interventions in the prevention and control of pneumonia.

## 1.4. Screening

- Home and kindergarten visits to screen for febrile cases.
- Inspect ventilation of living & working rooms and kindergartens.

## 1.5 Prevention And Control Of Pneumonia

### *Improve ventilation of houses*

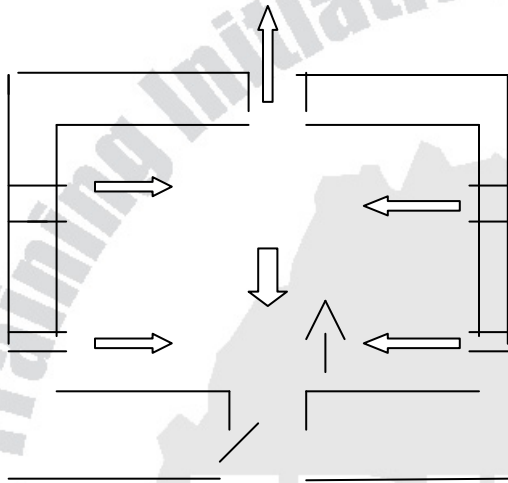
- Presence of sufficient oxygen in the house i.e. People are at ease in breathing.
- Reduction of bad odor in the house.
- Living rooms are not shared with domestic animals.
- Separate kitchen from living room.
- Adequate number of doors & windows for good air circulation in the house.

## 1.6 Health Education

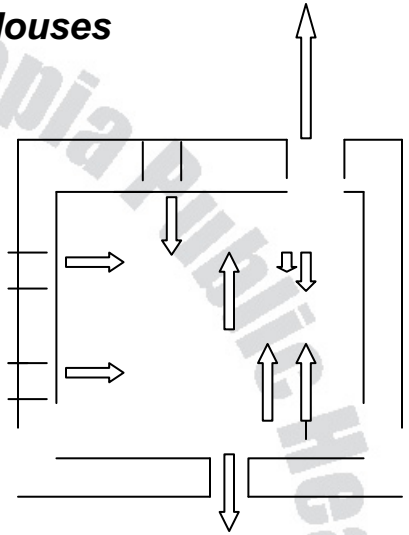
1. Understand the importance and role of health education in the prevention and control of pneumonia.
2. Increase the communities' awareness/knowledge and practice on
  - Proper ventilation of house
  - Breast-feeding
  - Immunization
  - Vitamin A Supplementation
  - Early detection of pneumonia symptoms and reporting to health institution
3. Participate and facilitate community mobilization on immunization and Vitamin A Supplementation

## 1.7. Learning Activity: Improved Ventilation Of Houses

### A. Location Of Windows In Rectangular Houses

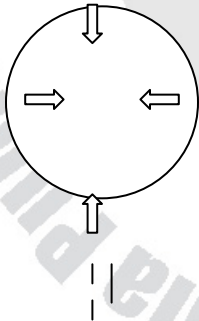


1) Through ventilation

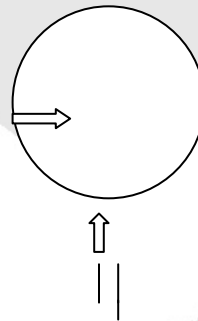


2) Cross-ventilation

### B. Location Of Windows In Circular Houses



a) Through ventilation

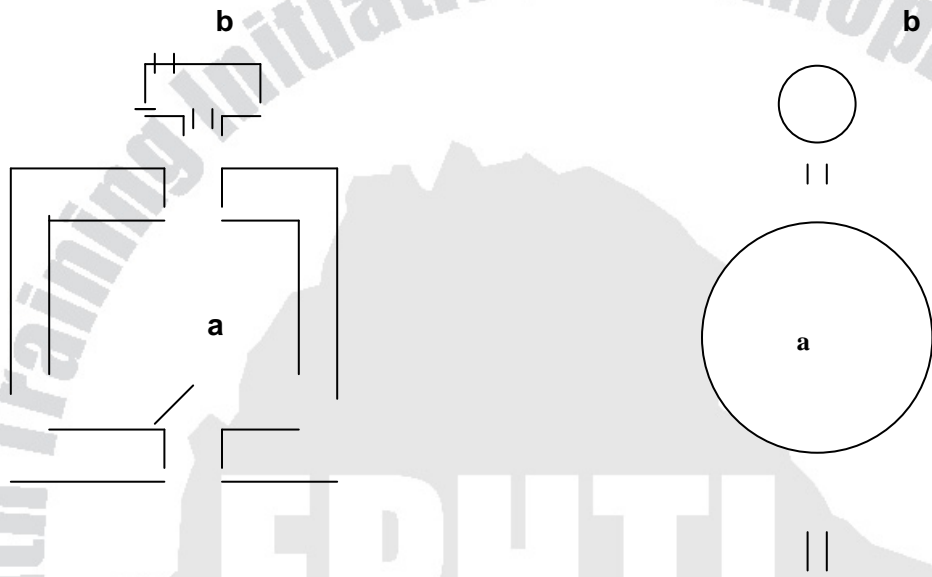


b) Cross-ventilation

### Note

- Through ventilation system has better ventilation than cross ventilation system.
- The total area of windows and doors should be 15 -20% of the total floor area in the same house.

### C. Location Of Kitchen House From Living Houses

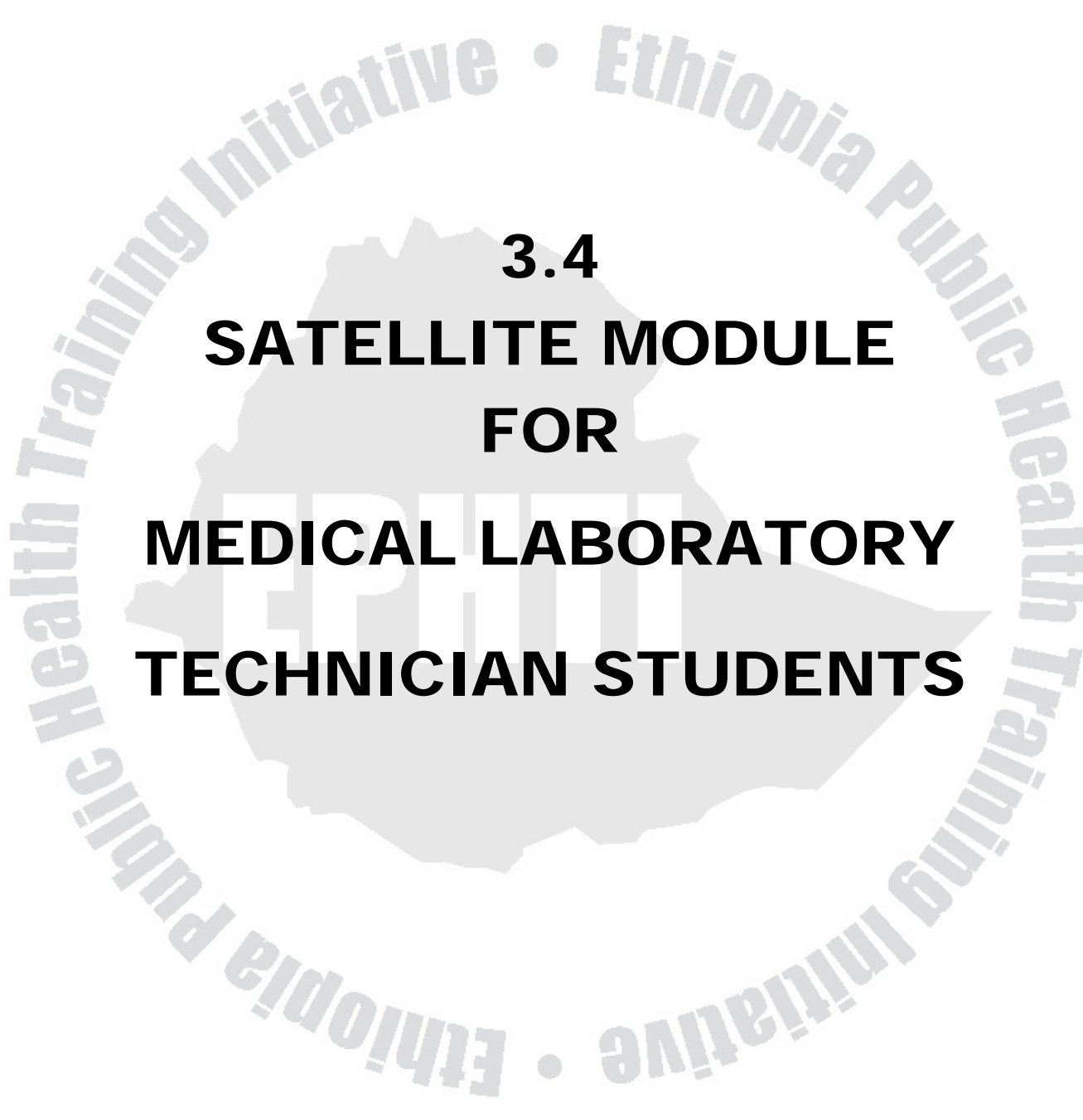


1) Rectangular house

2) Circular house

a. Living house

b. Kitchen house

The logo for the Ethiopia Public Health Training Initiative is a circular emblem. It features a map of Ethiopia in the center, with the acronym 'EPHTI' overlaid in large, bold, white letters. The text 'Ethiopia Public Health Training Initiative' is written in a circular path around the map, with a small dot separating the two phrases.

3.4  
SATELLITE MODULE  
FOR  
MEDICAL LABORATORY  
TECHNICIAN STUDENTS

# 1.0 Introduction

## 1.1. Purpose and Use Of the Satellite Module

The medical laboratory technician should know his or her tasks and roles as a member of the health center team. This satellite module provides clear activity of the laboratory technician in the diagnosis of pneumonia.

## 1.2. Learning Objective

***After completion of the activity you shall be able to:***

1. Mention the main essential laboratory diagnostic methods for the diagnosis of pneumonia
2. Describe the microscopic appearance of the common causative agents of pneumonia
3. Know ways of assessing quality of sputum samples

## 1.3. Laboratory Diagnosis

### 1.3.1. Specimen

- Respiratory secretions for gram staining
- Blood for complete blood count (White Blood Cell: total count and differential)
- Blood film to rule out blood parasites such as malarial parasites



- Pleural fluid (effusion or empyema) analysis
  - Effusion
    - a) Color→ turbid
    - b) Differential cell count→ Polymorphs > 1000/μL
  - Empyema
    - a) Color → Frank pus
    - b) Differential cell count → Polymorphs >10000/μL

Respiratory secretions are frequently collected to diagnose infection of the lower respiratory tract such as pneumonia. Respiratory secretion samples are difficult to collect without contamination from saliva. Therefore Bartlett's classification is used to assess the respiratory secretion samples.

### 1.3.2. Bartlett's Classification

<b>a) Number of Neutrophils/Low Power Field</b>	<b>Grading</b>
<10/LPF	0
10-25/LPF	+1
>25 /LPF	+2
Mucus	+1
<b>b) Number of squamous epithelial cells</b>	
10-25/LPF	-1
>25/LPF	-2
-----	-----
Total scoring	

*Scores ≤ 0 =lack of inflammation or presence of saliva.*

**Note that:**

1. If there are > 25 Neutrophils and <10 squamous epithelial cells per Low Power Field (LPF), it indicates purulent respiratory secretion.
2. Respiratory secretion is indicated by predominance of alveolar macrophages, and columnar cells.
3. If there are >25 squamous epithelial cells per LPF, it indicates oral secretion.
4. Borderline samples indicate combination of these results.

It is recommended that all sputum specimens containing purulent secretions should be processed whereas those containing oral secretions should be *recollected*.

### **1.3.3. Procedures**

**i. Reagents required**

- Crystal violet
- Gram's iodine
- Acetone-alcohol decolorizer
- Safaranin or diluted carbol fuschin

**ii. Specimen: respiratory secretions (if available)**

- Collection: proper specimen collection from the patient is essential.
- Container: clean container is required
- Type of specimen: deep coughed up sputum is usually lower respiratory secretion
- Rapid transport of the specimen to the laboratory for processing

### **iii. Steps**

1. Label the slide: every slide should be labeled with the date, patient's name and number.
2. Making of smears: use a piece of clean stick to transfer the sputum and soak the stick in locally available disinfectant.
3. Drying smears: allow the smear to air - dry completely.
4. Fixing of dried smears.

*Rapidly pass the slide, smear upper most three times through the flame of a spirit lamp or pilot flame of a Bunsen burner (alternatively as a fixator, add 95% methanol over the smear and air-dry).*

*Allow the smear to cool before staining.*

5. Cover the fixed smear with crystal violet stain for one minute.
6. Rapidly wash off the stain with clean water.
7. Tip of all the water and cover the smear with Gram's iodine for one minute.
8. Wash off the Gram's iodine with clean water.
9. Decolorize rapidly with acetone – alcohol for thirty seconds or with absolute alcohol for one minute and wash immediately with clean water.
10. Cover the smear with safranin for one minute.
11. Wash off the stain with clean water.
12. Wipe the back of the slide and let it air-dry.
13. Add a drop of immersion oil on the slide and examine the smear under the microscope with 10x objectives to see the staining & distribution of the material, and then with 100x objective to identify the bacteria.

#### **1.3.4. Reporting Gram Smears**

The report should include the following information:

1. The number of bacteria present: reported as many, moderate, few or scanty.

2. The gram reaction of the bacteria.
3. The morphology of the bacteria
4. The presence of pus cells and the number

#### **1.3.4. Variations in Gram Staining**

##### ***False Negative Results***

Gram positive organisms lose their ability to retain crystal violet and stain gram negatively. The following are among the reasons why this may happen:

1. Cell wall damage due to antibiotic therapy or excessive heat fixation of the smear.
2. Over decolorization of the smear.
3. Use of an iodine solution that is too old and therefore can not act as effective mordant.
4. Preparation of the smear from an old culture.

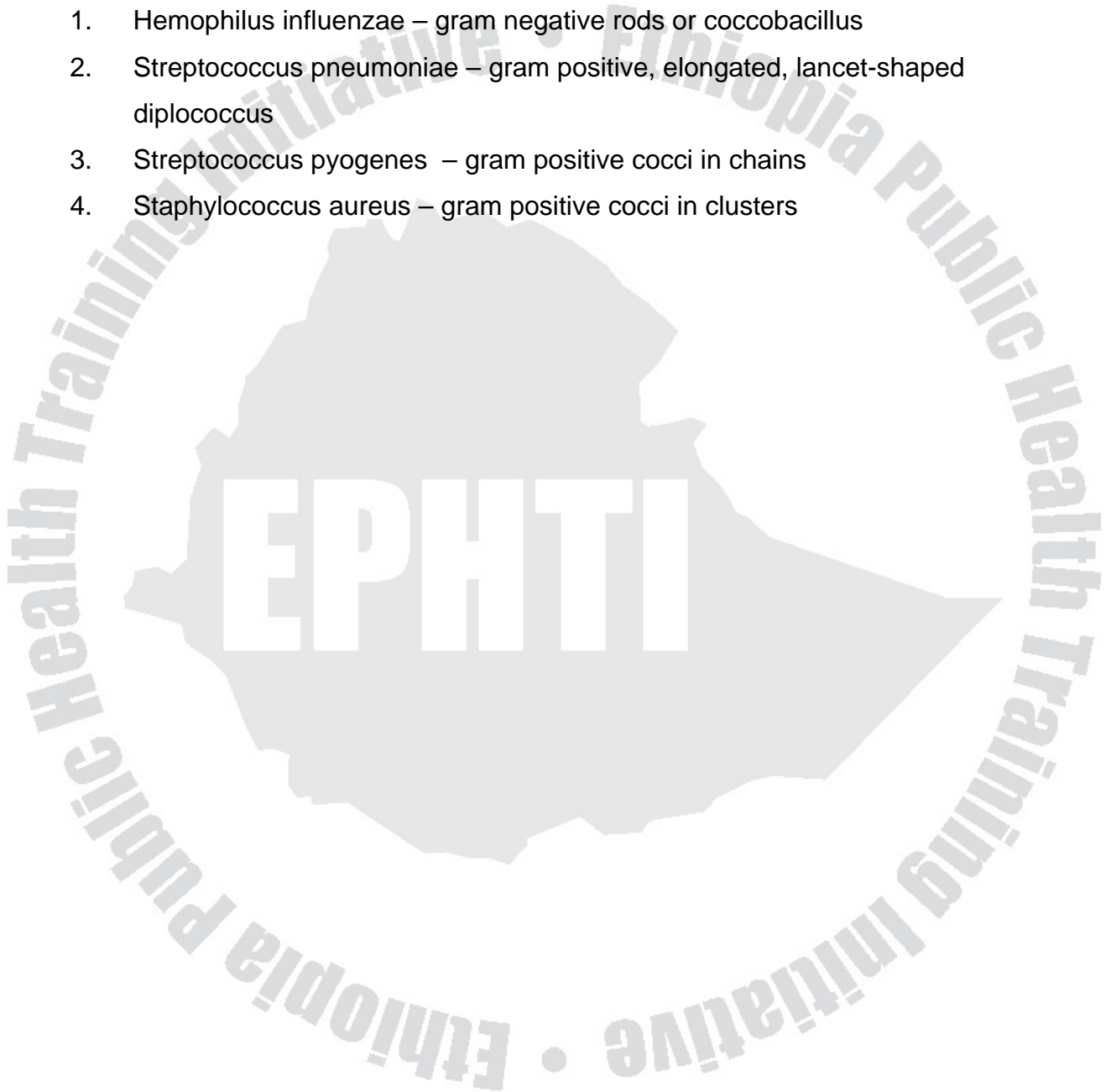
##### ***False Positive Results***

Gram negative bacteria staining as gram positive

1. Smear is too thick and not fully decolorized.
2. Provision of minimal time for decolorization.
3. When the decolorizer is highly diluted.

### 1.3.5. Microscopic Appearance of Common Bacterial Etiologic Agents of Pneumonia

1. Hemophilus influenzae – gram negative rods or coccobacillus
2. Streptococcus pneumoniae – gram positive, elongated, lancet-shaped diplococcus
3. Streptococcus pyogenes – gram positive cocci in chains
4. Staphylococcus aureus – gram positive cocci in clusters



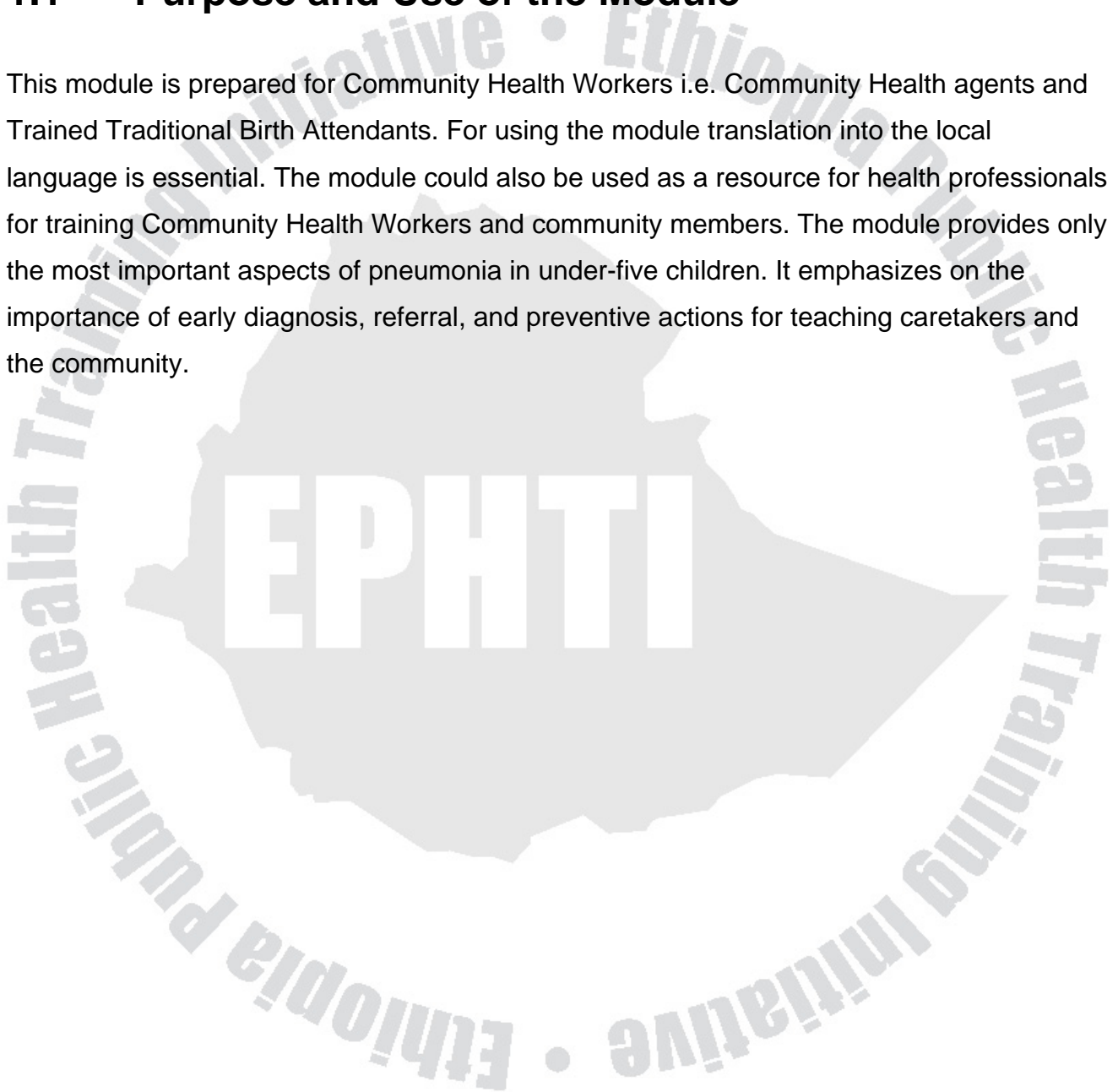


# COMMUNITY HEALTH WORKERS

## 1.0 INTRODUCTION

### 1.1 Purpose and Use of the Module

This module is prepared for Community Health Workers i.e. Community Health agents and Trained Traditional Birth Attendants. For using the module translation into the local language is essential. The module could also be used as a resource for health professionals for training Community Health Workers and community members. The module provides only the most important aspects of pneumonia in under-five children. It emphasizes on the importance of early diagnosis, referral, and preventive actions for teaching caretakers and the community.



## 1.2 Directions for Using the Module

Before studying the module, attempt all the questions written in the section 1.3. This will help the learner to assess the level of knowledge about pneumonia in under-five children. This includes the values, experience and practice of the community, because Community Health Workers are also part of the community.



Then, read the learning objectives. The objectives focus on the goals of the module.



The objectives are followed by brief description about pneumonia in under-five children. This part will help the learner to study and think about the problem and also take action.



The case study provided has been presented as similar to what is really happening in the community. Some of the rituals and actions may be different in different communities depending on the cultural background. However, the picture is typical. Try to answer the questions that are based on the case study.



Study each task presented in the table. The tasks elaborate on the activities of the CHWs. This will strengthen the actions.



The last part is the post-test. The learner must go through the post-test. The questions are those provided as pretest at the beginning. The purpose is to help the CHW assess whether there was a benefit and real progress in studying the module. However, it is very difficult to measure the learning process with the ten questions that are presented.



If you do not understand, go back and review the module.



## 2.0 Pre-test

*Attempt to answer all the questions*

1. Is pneumonia a killer disease, especially in children?
  - a) Yes
  - b) No
  
2. The cause of pneumonia in under-five children is
  - a) Evil eye
  - b) Smelling bad odor
  - c) Washing the body in the river
  - d) Exposing the child to the sun
  - e) Germs
  
3. A child with pneumonia may have
  - a) Fever
  - b) Cough
  - c) Breathing problem
  - d) Less appetite to breast milk and food
  - e) All of the above
  
4. Where do you go for help if your child develops pneumonia?
  - a) Holy-water
  - b) Traditional healer
  - c) Keeping the child at home
  - d) Health institution
  - e) All of the above
  
5. Is pneumonia treatable?
  - a) Yes
  - b) No
  - c) I do not know

6. Pneumonia could be effectively treated by a local healer
- a) True
  - b) False
7. What will be the responsibility of a mother concerning pneumonia?
- a) To buy drugs from a local pharmacy and give to the child
  - b) Recognize the symptoms of pneumonia
  - c) Take child to a health institution or community health worker
  - d) Observe the child until he develops severe symptoms
  - e) Only b and c
8. Which of the following factors will not help a child to be protected from pneumonia?
- a) Immunization
  - b) Breast-feeding and initiation of weaning at 4-6 months
  - c) Protecting children from being exposed to smoke from cooking areas
  - d) Giving antibiotics to children when they get common cold
  - e) Exposing small infants to sunshine
9. As a community health worker, which signs of pneumonia do you consider as the most important indicators?
- a) Running nose
  - b) On and off fever
  - c) Fast breathing
  - d) Chest in-drawing (abnormal movement of the chest with symptoms of respiratory problem)
  - e) Only c and d
10. If you find a child who is sick of pneumonia during home visiting, what will be your immediate action?
- a) Advise the mother to take the child to the nearby health institution
  - b) Give antibiotics to the child

- c) Advise the mother to isolate the child for protecting other children not to get infected
- d) Give antipyretic and observe the child for one or two days
- e) Advise the mother that the disease is self-limiting

## 2.1. Learning Objectives

1. *To understand the cause of pneumonia.*
2. *To describe the factors associated with pneumonia.*
3. *To make early diagnosis and to take the appropriate measures without delay.*
4. *To increase the awareness of mothers, care givers, families and communities on pneumonia through health education.*
5. *To encourage home visiting.*
6. *To help CHWs believe that pneumonia is a killer disease.*

## 2.2. Significance and Brief Description of the Problem

Pneumonia is an infectious disease of the lung and one of the main killers of children in Ethiopia. It is more dangerous for malnourished children.

There are many factors that contribute to the existence of this disease. One is common cold. Most coughs and colds get better without any special medicine. But sometimes colds turn into pneumonia. Too many children die of pneumonia every year.

If proper care is given in time, pneumonia is treatable and curable. To tackle such a killer disease, community health workers should know how to diagnose, manage, control and prevent pneumonia.

Therefore, based on this principle this guiding note is prepared for community health workers (Community Health Agents/or Traditional Birth Attendants).

The trainees can use this learning material in the training of community health workers after translating it into local languages.

## 2.3. Case Study: Learning Activity

### Semegnew and His Fate

W/o Mastewal is living in the rural area of Dembia District about sixty kilometres (six hours walking distance) from the main town, Kolla Duba.

She has one son, whom she got after much praying. Semegnew, her beloved and only son, is now five months old. The mother mostly keeps him away from the evil eye "Buda" by covering him with cloths and not to be seen by anybody.

When she was preparing to celebrate his sixth month birthday, Semegnew was seriously sick. He had developed unexpected fever, running nose, cough, and vomiting.

The poor mother is shocked by his condition and took him to the local healer,"Awakie". Shah Abdro, the known traditional healer, chewing his "chat" observed the poor baby. Then he went to the back of his house and returned with some leaf and root. He ordered the mother to rub him by the leaves and fumigate him with the burning roots. She tried to treat her son as ordered but without improvement.

She was restless and could not control herself. Seeing her condition, her neighbour advised her to take him to another witch.

Memrie Mentenot is famous for "opening books" to tell the fate of anybody. So W/o Mastewal took her son to this person. After putting some amount of money in front of Memrie, she asked about Semegnew.

Memrie asked the name of the son and opened his known book. Within a matter of five

minutes he ordered the mother to kill for him a “red hen” and give him the liver, which should be chewed first.

After borrowing money from her neighbor, W/o Mastewal bought the hen and applied as ordered. But Semegnew could not take the chewed liver; he vomited and his condition was worsening.

W/o Mastewal could not control herself and was crying loud. At this time all the neighbors came around. One of them came with Holy Water, "Tebel" and poured the cold water over the weak baby.

By coincidence, the trained traditional birth attendant was passing by and noticed people gathered. She directly went into the house, observed the baby, and asked the mother to take him to the health post.

Both, the community health agent and the Trained Traditional Birth Attendant, then examined the weak baby. He had a high fever, was coughing and could not breath properly. They discussed him and decided to wait for the arrival of the health center staff. Luckily, this day was outs reach program for them. After half an hour they arrived. Before they started their daily program, they examined Semegnew.

They had no medicine at hand so they told their driver to transport him to the health center immediately.

The moment they arrived at the health center, the on-duty staff examined Semegnew and admitted him for some supportive treatment. Later on they referred him to Gondar College of Medical Sciences Hospital.

What will be the fate of Semegnew?

## **Questions**

1. What is the problem of Semegnew?
2. What measures do you take if the health center staff were not around the health post?
3. What would you advise to the mother if she had come directly to you?
4. Do you have such cases in your community? Is it a serious problem?  
What do you think are the reasons?
5. How are you going to prevent such a problem?
6. What will be your controlling measure to tackle such a problem?

## **2.4 Pneumonia in under-five children**

### **2.4.1. Definition**

Pneumonia is an acute infection of the lungs. It can start on its own, follow from a cold or measles or whooping cough. All children can get pneumonia but babies under-one year of age are more likely to get it than older children.

### **2.4.2. Causes**

Germs cause pneumonia.

### **2.4.3. Pre-disposing Factors**

Malnutrition, un-immunized child, low level of education of caregivers, low birth weight, overcrowding, poor ventilation, and poor socio-economic status can predispose to pneumonia.

## 2.4.4. Clinical Manifestation

### 2.4.4.1 General Danger Signs

1. Sick-child <sup>TM</sup> Assess for Danger signs <sup>TM</sup>
- Convulsions
  - Unconscious, lethargic
  - Unable to drink/breastfeed
  - Repeated vomiting

#### 2. Assess for cough/difficult breathing

- Danger Signs <sup>TM</sup>
- Fast breathing
  - Lower chest indrawing
  - Stridor (a rattling noise heard when breathing)
  - Grunting when breathing out

#### How to assess chest indrawing

- ◆ Ask the mother to lift the child's clothes carefully
- ◆ See how the lower part of the chest moves
- ◆ A child has chest indrawing if
  - a) The whole area of the lower part of the chest moves in when the child breaths in, not just the spaces between the ribs, and
  - b) The inward chest movement happens every time the child breathes in and is clearly visible.



*A Child with Pneumonia*

### 3. Check for fever

- ◆ Measure the child's temperature
- ◆ If it is greater than 37.5°C, it should be taken as febrile.
- ◆ **Try to feel the fever of the child by using your hands if thermometer is not available**

## 2.5. Prevention and control

1. Advice mothers/ caregivers on breast feeding/weaning practice/well feeding



*Breast Feeding*

2. Educate mothers/ care givers /families/community on
  - Danger signs of pneumonia,
3. Early diagnosis, management and early referral
  - Immunization,
  - Housing – decrease over crowding,
  - Open doors and windows for good ventilation



- Proper nutrition
- Do not expose children to smoke from cooking areas or from cigarette
- Vitamin A supplementation
- Pneumonia must be treated with out delay

4. Program of home visiting



*Vaccination*



*A house with good ventilation*



*Feed the child*



*Take the child to the nearest health institution*

## 2.6. Tasks of Community Health Workers

*The CHWs should perform the following activities at each level to control and prevent pneumonia*

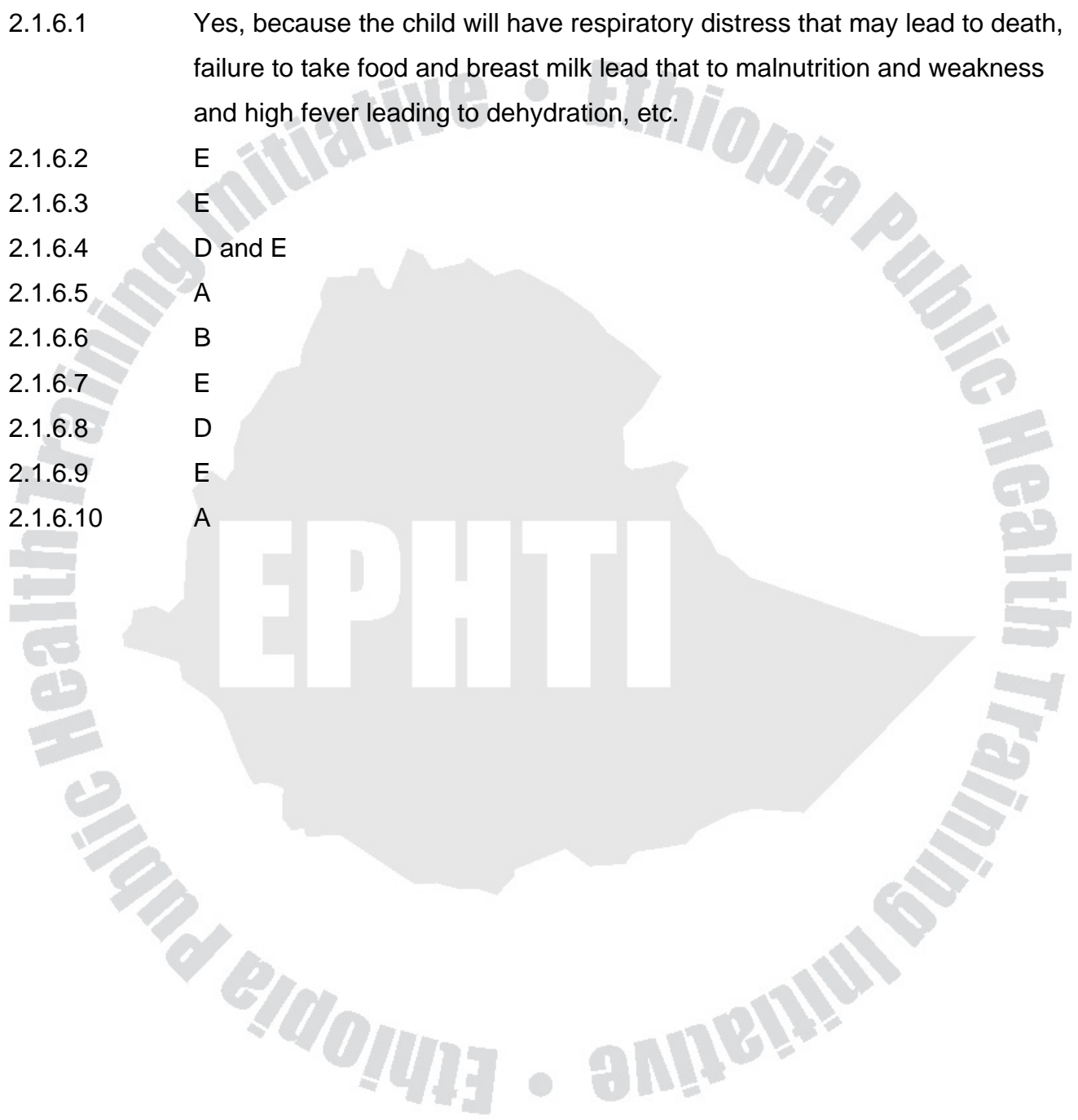
Level	Activities
<i>Health Post</i>	<ul style="list-style-type: none"> <li>◆ Secure the availability of               <ul style="list-style-type: none"> <li>- Drugs, such as antipyretics, ORS, etc</li> <li>- Posters &amp; leaflets for Health Education</li> </ul> </li> <li>◆ Early diagnosis &amp; early referring of cases</li> <li>◆ Programming of the different health services such as home visit, health education etc.</li> <li>◆ Defaulter tracing on immunization program</li> </ul>
<i>Home</i>	<ul style="list-style-type: none"> <li>◆ Frequent home visiting</li> <li>◆ Increase the awareness of mother/caregivers through health education</li> <li>◆ Encourage mothers/caregivers on breast-feeding, weaning food, ORS, immunization, etc.</li> <li>◆ Health education about proper housing, ventilation, environmental sanitation, child care, etc</li> <li>◆ Advise mothers (caregivers) on immediate reporting of illness in their children</li> </ul>
<i>Community</i>	<ul style="list-style-type: none"> <li>◆ Disseminate information about immunization, defaulters tracing</li> <li>◆ Health education on proper housing and ventilation</li> <li>◆ Encourage to have an active &amp; strong health committee</li> </ul>

## 2.7. Post-test

Refer to the pretest.

## Key

- 2.1.6.1 Yes, because the child will have respiratory distress that may lead to death, failure to take food and breast milk lead that to malnutrition and weakness and high fever leading to dehydration, etc.
- 2.1.6.2 E
- 2.1.6.3 E
- 2.1.6.4 D and E
- 2.1.6.5 A
- 2.1.6.6 B
- 2.1.6.7 E
- 2.1.6.8 D
- 2.1.6.9 E
- 2.1.6.10 A



## Take Home Message For Mothers (Caregiver)

### About Pneumonia In Under-Five Children

- Many children die of pneumonia.
- Germs cause pneumonia.
- These germs are very small particles that could not be seen with out a microscope.
- As a caregiver of children, you are the most important person to fight against pneumonia and save the lives of children.
- Learn to recognize the signs of pneumonia in children.

#### Recognize the signs of pneumonia

1. Is the child breathing fast (compare with previous breathing conditions)?  
⇒ ***If there is fast breathing the child has pneumonia***
2. Does the child have chest indrawing (an abnormal chest movement associated with difficult breathing or cough)?
3. Do you hear stridor when the child is calm?

#### Also ask and look

4. Is the child breast-feeding or feeding?
  5. Is the child vomiting everything?
  6. Does the child have convulsion or seizure?
- ⇒ ***The signs number 2 to 6 remind you that the child is very seriously sick***

## **Actions**

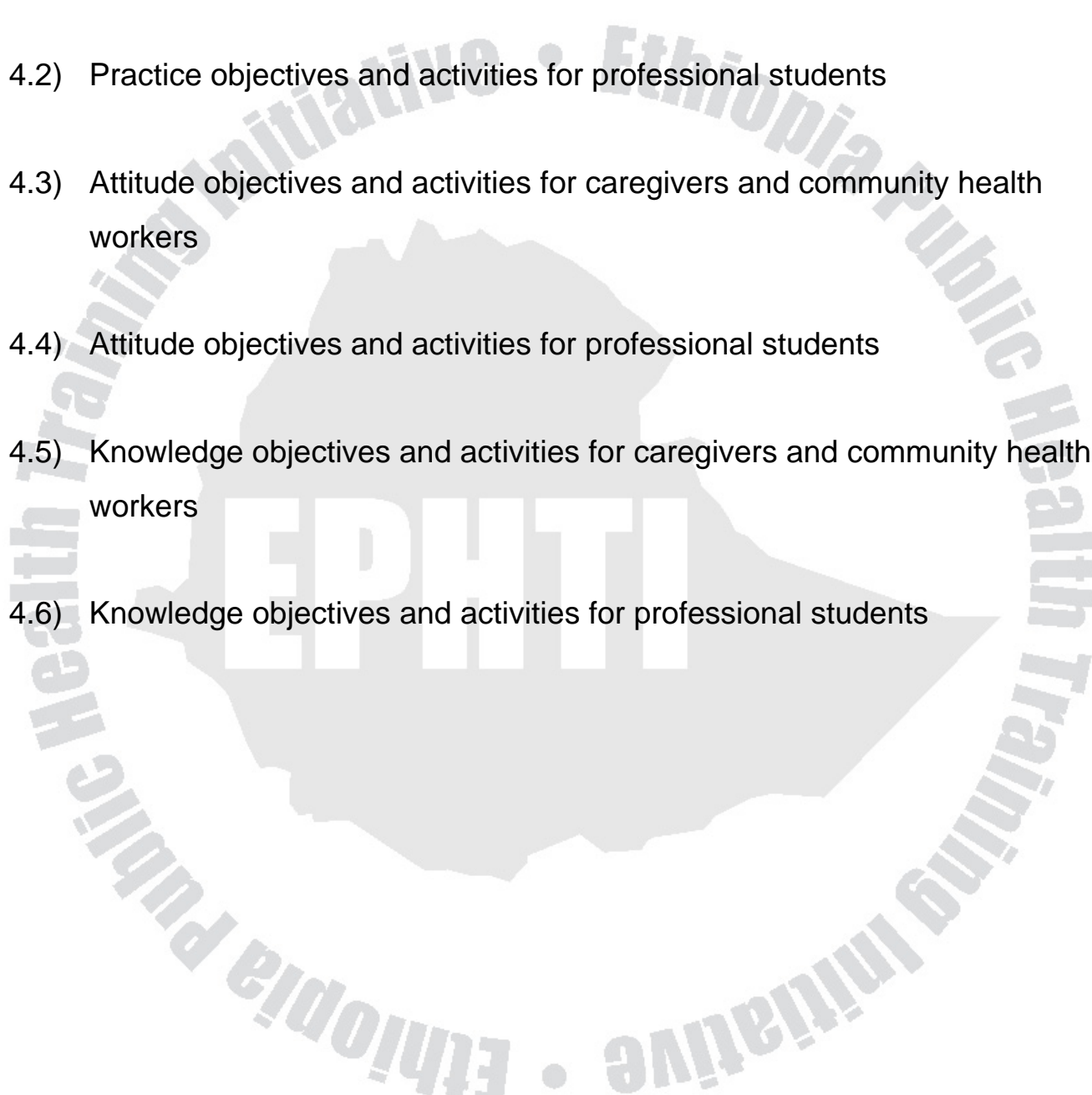
- If any of the above signs are present rush your child to the nearest health institution or to the health post.
- Give the prescribed drugs to the child
- If the instructions of the health professional are not clear, *ASK for clarification*
- Observe the child. If there is no improvement or there is deterioration, re-visit the health institution.
- Continue to feed the child and offer water frequently.

### **Protect your child from pneumonia**

- *Start and complete the immunization schedule*
- *Breast-feed the child*
- *Initiate weaning at 4-6months of age, the weaning food should be nutritious (ask a health professional)*
- *Make sure the child takes vitamin A capsules*
- *Expose the infant to direct morning sunshine*
- *Protect the child from smoke coming out of kitchen or cooking areas*
- *Do not allow cigarette smokers to smoke in the same room where the child is kept*
- *Keep the child in a ventilated room*



UNIT FOUR  
ROLE AND TASK ANALYSISBASED  
ON LEARNING OBJECTIVES AND  
ACTIVITIES

- 
- 4.1) Practice objectives for caregivers and community health workers
  - 4.2) Practice objectives and activities for professional students
  - 4.3) Attitude objectives and activities for caregivers and community health workers
  - 4.4) Attitude objectives and activities for professional students
  - 4.5) Knowledge objectives and activities for caregivers and community health workers
  - 4.6) Knowledge objectives and activities for professional students

**Table 1: Practice Objectives For Caregivers And Community Health Workers**

Learning objectives	Activities	
	Mother (caregiver)	Community Health Worker
Practice Breast-feeding and Weaning	<ul style="list-style-type: none"> <li>- Exclusive breast feeding in the first 4-6months</li> <li>- Continue Breast feeding</li> <li>- Avoid bottle feeding</li> <li>- Start weaning at 4-6 months of age</li> </ul>	<ul style="list-style-type: none"> <li>- Encourage and teach mothers to breast feed and to start weaning at 4 to 6 months</li> <li>- Discourage bottle feeding</li> </ul>
Increase Immunization coverage in the catchment area	<ul style="list-style-type: none"> <li>- Attend the EPI schedule regularly</li> <li>- Keep the vaccination card properly</li> <li>- Report to the CHA about any missed immunization</li> </ul>	<ul style="list-style-type: none"> <li>- Disseminate information about immunization in public meetings, home visits</li> <li>- Mobilize the community for immunization schedules</li> <li>- Participate in vaccination (e.g. measles)</li> <li>- Trace defaulters</li> </ul>
Improve housing condition and ventilation	<ul style="list-style-type: none"> <li>- Separate kitchen from the main house</li> <li>- Ventilate the house by opening windows and doors</li> </ul>	<ul style="list-style-type: none"> <li>- Give HE about the benefit of ventilation</li> </ul>
Make appropriate diagnosis early	<ul style="list-style-type: none"> <li>- Recognize the danger signs of pneumonia early</li> <li>- Early visit to the nearby CHW or health institution</li> </ul>	<ul style="list-style-type: none"> <li>- Detect danger signs of pneumonia and refer or accompany to the nearby health institution immediately after initiation of treatment</li> </ul>
Treat pneumonia	<ul style="list-style-type: none"> <li>- Give treatments as prescribed</li> <li>- Keep medicines in places where children could not get access</li> <li>- Contact health personnel in case the child does not improve or the illness gets worse</li> </ul>	<ul style="list-style-type: none"> <li>- Provide supportive treatment (e.g. antipyretics)</li> <li>- Encourage mothers to continue breast feeding/ weaning food and fluids</li> </ul>



**Table 2: Practice objectives and activities for professional student**

Learning objectives	Activities		
	Health officer	PHNurse	Sanitarian
Practice Breast feeding and Weaning	Provide HE about: -The importance of BF & weaning - Discourage bottle feeding	Demonstrate to the mother: - Proper practice of BF - Preparation of balanced diet for weaning foods - Follow up through home visiting	-Provide Health Education to mothers about: - The importance of proper practice of Breast Feeding
Increase Immunization coverage in the catchments area	-Plan, organize, coordinate and supervise EPI activities - Document and report EPI activities	-Administer vaccine properly to the target group - Schedule EPI program - Maintain cold chain during transportation to vaccination sites - Supervise EPI activities - Sterilize instruments (syringe & needle) - Recording & reporting	- Maintain cold chain - Schedule EPI program - Maintain refrigerators and equipment - Mobilize community
Improve housing condition & ventilation	- Organize health education activities on ventilation and proper housing to communities	- Provide health education about proper housing at community and home level	- Provide technical advice & support in planning during house construction - Advice on the construction of stove, kitchen and windows
Make early diagnosis	- Collect information through systematic history taking and physical examination - Diagnose & detect signs of pneumonia	-Communicate clearly with caregivers & the community - Diagnose & detect danger signs of pneumonia	- Screen and refer febrile children to the near by health institution - Home visit & visit to kindergarten
Treat pneumonia	- Treat the sick child with antibiotics - Correct fluid loss - Advise mother to continue breast feeding/weaning/ fluids - Refer to hospital if indicated	-Treat the child as prescribed - Correct fluid loss, control fever - Advise to continue BF/weaning - Explain to the mother about the treatment, danger signs & when to bring the child if condition gets worse	—

**Note:** the task of Medical laboratory Technology technician students is to perform requested laboratory investigations

**Table 3: Attitude Objectives And Activities For Caregivers And Chws**

Learning objectives	Activities	
	Mothers (caregiver)	CHWs
Give value to breast-feeding & weaning	<ul style="list-style-type: none"> <li>- Believe on the importance of breast feeding &amp; weaning of the child</li> <li>- Believe that feeding &amp; giving fluid during illness is very important</li> </ul>	<ul style="list-style-type: none"> <li>- Convince mothers on the importance of breast-feeding &amp; weaning</li> </ul>
Believe immunization can reduce the risk of pneumonia	<ul style="list-style-type: none"> <li>- Accept the importance of immunizing a child</li> <li>- Accept some of the minor side effects of immunization such as fever compared to the benefits</li> </ul>	<ul style="list-style-type: none"> <li>- Convince mothers about the importance of immunization -</li> <li>-Convince mothers that the side effects of vaccination are not serious as compared to having the disease</li> </ul>
Believe that pneumonia is caused by germs & transmitted through inhalation	<ul style="list-style-type: none"> <li>- Believe that pneumonia is caused by germs &amp; transmitted from the sick to the healthy child by coughing, sneezing, etc</li> </ul>	<ul style="list-style-type: none"> <li>- Convince mothers that pneumonia is caused by germs &amp; transmitted from the sick to the healthy child through inhalation</li> </ul>
Give value to improved ventilation of house	<ul style="list-style-type: none"> <li>- Believe that improved ventilation of houses reduce the transmission of germs</li> </ul>	<ul style="list-style-type: none"> <li>Convince the community that closing of doors and windows does not prevent pneumonia; instead can spread the disease</li> </ul>
Involve caregivers in the management of pneumonia	<ul style="list-style-type: none"> <li>Accept that mothers are the most important partners in the treatment process</li> </ul>	<ul style="list-style-type: none"> <li>Convince caregivers that their involvement in the treatment of pneumonia is very important</li> </ul>

**Table 4: Attitude Objectives And Activities For Professional Students**

Learning objectives	Activities			
	Health officer	PHNurse	Sanitarian	Medical Laboratory Technology
Give value to breast feeding & weaning	- Encourage exclusive breast feeding for the first 4-6 months and weaning starting 4-6 months - Use different methods such as counseling, health talks to change mothers feelings towards breast feeding & weaning	- Encourage breast feeding & weaning - Use different methods such as counseling health talks to change mothers feelings towards breast feeding & weaning	- Encourage breast feeding & weaning - Use different methods such as health talks to change mothers feelings towards breast feeding & weaning	- Encourage breast feeding & weaning - Use different methods such as health talks to change mothers feelings towards breast feeding & weaning
Help people believe that immunization reduce the risk of pneumonia	Convince people that immunization reduces the risk of acquiring pneumonia through HE and provision of immunization services	Convince people that immunization reduces the risk of acquiring pneumonia through routine provision of HE on immunization and immunization services	Convince people that immunization reduces the risk of acquiring pneumonia through HE and provision of immunization services	Convince people that immunization reduces the risk of acquiring pneumonia through HE and provision of immunization services
Help people believe that pneumonia is caused by micro organisms & transmitted through inhalation	Convince people through health education on the mode of transmission & causes of pneumonia	Convince people through health education on the mode of transmission & causes of pneumonia	Convince people through health education on the mode of transmission & causes of pneumonia	Convince people through health education on the mode of transmission & causes of pneumonia
Give value to ventilation	-Advise people on the importance of minimizing over-crowding and suffocation due to kitchen smoke	- Advise people on the importance of minimizing over-crowding and suffocation due to kitchen smoke	Convince communities about the importance of ventilation through demonstrations on how to improve ventilation, construct model houses	—
Believe in the caregivers role in treatment of pneumonia	- Respect mothers & tell their role - Make sure care givers understand their roles	- Respect mothers & tell their roles - Make sure that caregivers understand their roles	- Respect mothers - Communicate clearly - Make sure that care givers understand their roles	- Respect mothers - Communicate clearly - Make sure that care givers understand their roles

**Table 5: Knowledge Objectives And Activities For Caregivers And Chws**

Learning objectives	Activities	
	Mothers (caregivers)	CHWs
Describe the causes of pneumonia	Identify that pneumonia is caused by germs	Describe that pneumonia is caused by germs
Describe the diagnosis of pneumonia	Identify the danger signs of pneumonia such as fast breathing and chest in-drawing	Describe the main signs & symptoms of pneumonia
Describe the risk factors for pneumonia	Identify the most relevant risk factors for pneumonia such as malnutrition	Describe the most important risk factors for pneumonia
Describe the recommended treatment protocols	Give the medications to the child according to the instructions provided Understand the importance of giving fluid, food & breast milk	- Describe the recommended treatment including food & hydration - Describe the conditions for referring the child
Identify the preventive and control measures	Identify the preventive & control methods such as breast-feeding, immunization, and environmental control	Identify and teach the preventive & control methods

**Table 6: Knowledge Objectives And Activities By Category Of Students**

Learning objectives	Activities			
	Health officer	PHNurse	Sanitarian	Medical Laboratory Technology
Describe the causes of pneumonia	- Describe the causes of pneumonia	- Describe the major causes of pneumonia	- Describe the major causes of pneumonia	- Describe the principal micro-organisms and their characteristics
Identify the steps in the diagnosis of pneumonia	- Describe the clinical pictures of pneumonia in detail -List the laboratory investigations done	- Describe the clinical pictures of pneumonia		Describe the main laboratory investigations and procedures done
Describe the risk factors for pneumonia	- Describe all known risk factors for pneumonia	- Describe the main risk factors for pneumonia	- Describe the main risk factors for pneumonia	- Describe the main risk factors for pneumonia
Describe the recommended treatment protocol	- Describe the type, the doses & side effects of drugs used for treatment of pneumonia	- Describe the type, the doses & side effects of drugs used for treatment of pneumonia	—	—
Describe the preventive & control measures	- Describe preventive & control measures	- Describe preventive & control measures	- Describe preventive & control measures	- Describe main preventive & control measures



UNIT FIVE  
GLOSSARY

<b>Agent:</b>	Substance or organism, which causes a disease or condition.
<b>Alveolus:</b>	Small cavity, such as one of the air sacks in the lungs (plural alveoli).
<b>Antipyretic:</b>	Drugs used to treat fever.
<b>Arthritis:</b>	Painful inflammation of a joint.
<b>Bacteria:</b>	Tiny organisms, many of them cause diseases. (Singular = bacterium).
<b>Caregiver:</b>	One who takes care of the child either the mother or proxy.
<b>Carditis:</b>	Inflammation of the connective tissue of the heart.
<b>Chest indrawing:</b>	Pulling towards the inside. Pulling -in of the chest.
<b>Clinical history:</b>	A systematic account of the medical and psychosocial occurrences in a patient's life and factors in family, ancestors, and environment that may have a bearing on the patient's condition.
<b>Community Health Workers:</b>	Member of the community trained in Primary Health Care (PHC) for three months or so. He/she is either Community Health Agent or a Trained Traditional Birth Attendant.
<b>Complication:</b>	1) condition where two or more diseases exist in a patient, and are not always connected. 2) situation where a patient develops a second disease which changes the course of treatment for the first.
<b>Convulsions:</b>	Rapid involuntary contracting and relaxing of the muscles in several parts of the body.
<b>Core Module:</b>	The main teaching-learning module prepared for all categories of team members including CHWs.
<b>Crepitation:</b>	Crackling sound heard during auscultation of the lungs
<b>Cyanosis:</b>	Bluish discoloration of the skin and mucous membrane due to lack of oxygen in the blood.
<b>Diagnosis:</b>	Identification of a disease or condition by a scientific evaluation of physical signs, symptoms, history, laboratory tests, and procedures.
<b>Empyema:</b>	Collection of pus in a cavity, especially in the plural cavity.
<b>Environment:</b>	Conditions and influences under which an organism lives.
<b>Epidemiology:</b>	The study of the occurrence, distribution, determinant, and causes of disease in human population.
<b>Extra Pulmonary Infection:</b>	Infection of organs other than the lungs
<b>Host:</b>	Person or animal on which a parasite lives.
<b>Immuno-compromised:</b>	When an individual's natural defensive system is not working properly or is failing

**Interstitial space:**

**Lethargy:** The state of becoming weak, tired and inactive or loss of interest in the surrounding.

**Meningitis:** Inflammation of the meninges or covering of the brain tissues.

**Microorganisms:** a Very small organism, which may cause diseases and can only be seen with a microscope, includes viruses, bacteria, fungi, parasites, etc.

**Myocarditis:**

**Morbidity:** Being diseased or suffering from a disease or condition.

**Mortality:** Deaths occurring as a result of a disease or condition usually expressed in rates i.e. with a numerator and denominator multiplied by a factor.

**Osteomyelitis:**

**Pathogenesis:** The source of causes of an illness or abnormal conditions and the process of changes in side systems, organs, tissues and cells.

**Pericarditis:**

**Pneumothorax:**

**Post-test:** Self-assessment test after going through the module.

**Pre-test:** Self-assessment test before going into the module.

**Predisposing (risk) factors:** Factors that make a person at risk of getting a disease or problem.

**Respiratory failure:**

**Risk:** 1) possibility of getting an infected or having a harmful condition.

**Satellite Modules:** a complementary learning-teaching module to the Core Module prepared for each category based professional need or task requirements.

**Sepsis:**

**Virus:** The smallest infectious agent, which multiplies in living cells and causes disease.





**UNIT SIX**  
**ABBREVIATIONS**

**EPHTI**

<b>ARI:</b>	Acute Respiratory Infections
<b>BF:</b>	Breast-feeding
<b>CHAs:</b>	Community Health Agents
<b>CHWs:</b>	Community Health Workers
<b>EHT(SAN):</b>	Environmental Health Technician or Sanitarian
<b>EPI:</b>	Expanded Program on Immunization
<b>HE:</b>	Health Education
<b>HO:</b>	Health Officer (BSc level)
<b>IMCI:</b>	Integrated Management of Childhood Illness
<b>MLT:</b>	Medical Laboratory Technician (Diploma level)
<b>MOH:</b>	Ministry of Health
<b>PHC:</b>	Primary Health Care
<b>PHN:</b>	Public Health Nurse (Diploma level)
<b>RSV:</b>	Respiratory Syncytial Virus
<b>WBC:</b>	White Blood Cell
<b>TTBA</b>	Trained Traditional birth attendants
<b>WHO</b>	World Health Organization



# **UNIT SEVEN**

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Annex-I Management flowchart (*Adopted from the WHO manual on IMCI*)

**ASSESS AND CLASSIFY THE SICK CHILD AGE 2 MONTHS UP TO 5 YEARS**

**ASSESS**

**CLASSIFY**

**IDENTIFY TREATMENT**

**ASK THE MOTHER WHAT THE CHILD'S PROBLEMS ARE**

- Determine if this is an initial or follow-up visit for this problem
- If follow-up visit, use the follow-up instruction on TREAT THE CHILD chart.
- If initial visit, assess the child as follows:

**CHECK FOR GENERAL DANGER SIGNS**

- |  |   |
|--|---|
| <p><b>ASK:</b></p> <ul style="list-style-type: none"> <li>• Is the child able to drink or breastfeed?</li> <li>• Does the child vomit everything?</li> <li>• Has the child had convulsions?</li> </ul> | <p><b>LOOK:</b></p> <p>See if the child is lethargic or unconscious</p> |
|--|---|

**A child with any general danger sign needs URGENT attention: complete the assessment and any pre-referral treatment immediately so referral is not delayed.**

USE ALL BOXES THAT MATCH THE CHILD'S SYMPTOMS AND PROBLEMS TO CLASSIFY ILLNESS.

**THEN ASK ABOUT MAIN SYMPTOMS:  
Does the child have cough or difficult breathing?**

**IF YES, ASK: LOOK, LISTEN, FEEL:**

- **For how long?** - Count the breaths in one minute.
  - Look for chest in drawing.
  - Look and listen for stridor.

**CHILD MUST BE CALM**

**Classify  
COUGH or  
DIFFICULT  
BREATHING**

If the child is :	Fast breathing is:
2 months up to 12 months	50 breaths per minute or more
12 months up to 5 years	40 breaths per minute or more

**SIGNS**

**CLASSIFY AS**

**TREATMENT**

(Urgent pre-referral treatments are in bold print.)

<ul style="list-style-type: none"> <li>- Any general danger sign or</li> <li>- Chest indrawing or</li> <li>- Stridor calm child.</li> </ul>	<p><b>SEVERE PNEUMONIA OR VERY SEVERE DISEASE</b></p>	<ul style="list-style-type: none"> <li>- Give first dose of an appropriate antibiotic.</li> <li>- Refer <b>URGENTLY</b> to hospital.*</li> </ul>
<ul style="list-style-type: none"> <li>- Fast breathing</li> </ul>	<p>PHNUMONIA</p>	<ul style="list-style-type: none"> <li>- Give an appropriate antibiotic for 5 days.</li> <li>- Soothe the throat and relieve the cough with a safe remedy.</li> <li>- Advise mother when to return immediately.</li> <li>- Follow-up in 2 days.</li> </ul>
<p>No signs of pneumonia or very severe-disease.</p>	<p><b>NO PNEUMINIA: COUGH OR COLD</b></p>	<ul style="list-style-type: none"> <li>- If coughing more than 30 days, refer for assessment.</li> <li>- Soothe the throat and relieve the cough with a safe remedy.</li> <li>- Advise mother when to return immediately.</li> <li>- Follow-up in 5 days if not improving.</li> </ul>

## CARRY OUT THE TREATMENT STEPS IDENTIFIED ON THE ASSESS AND CLASSIFY CHART

### TEACH THE MOTHER TO GIVE ORAL DRUGS AT HOME

Follow the instruction below for every oral drug to be given at home. Also follow the instruction listed with each drug's dosage table.

- ◆ Determine the appropriate drugs and dosage for the child's age or weight.
- ◆ Tell the mother the reason for giving the drug to the child.
- ◆ Demonstrate how to measure a dose.
- ◆ Watch the mother practice measuring a dose by herself.
- ◆ Ask the mother to give the first dose to her child.
- ◆ Explain carefully how to give the drug, then label and package the drug.
- ◆ If more than one drug will be given, collect, count and package each drug separately.
- ◆ Explain that all the oral drug tablets or syrups must be used to finish the course of treatment, even if the child gets better.
- ◆ Check the mother's understanding before she leaves the clinic.

#### Give an Appropriate Oral Antibiotic

- ◆ FOR PNEUMONIA, ACUTE EAR INFECTION OR VERY SEVERE DIARRHEA:

First-Line ANTIBIOTIC:

SECOND-LINE ANTIBIOTIC:

	COTRIMOAZOLE		AMOXYCILLIN		
	(Trimethoprim-sulphamethoxazole) - Give two times daily for 5 days		- Give three times daily for 5 days		
	ADULT TABLET	PEDIATRIC TABLET	SYRUP	TABLET	SYRUP
Age or Weight	80 mg trimethoprim -400mg	20mg trimethoprim -100mg sulphamethoxazole	40mg trimethoprim -200mg sulphamethoxazole	250mg	125mg per 5ml
2 months up to 12 months (4-10kg) 12 months up to	1/2	2 sulphamethoxazole	5.0ml	1/2	5ml
5 years (10-19kg)	1	3	7.5ml	1	10ml

## GIVE FOLLOW-UP CARE

### ▪ PNEUMONIA

- Care for the child who return for follow-up using all the boxes that match the child's previous classifications,
- If the child has any new problem, assess, classify and treat the new problem as on the ASSESS AND CLASSIFY chart.

### ❖ PNEUMONIA

After 2 days:

Check the child for general danger signs.

Assess the child for cough or difficult breathing. See ASSESS & CLASSIFY Chart.

Ask:

- Is the child breathing slower? }
- Is there less fever? }
- Is the child-eating better? }

Treatment:

- ❖ **If chest in drawing or a general danger sign**, give does of second-line antibiotic or Intramuscular chloramphenicol. Then refer URGENTLY to hospital
- ❖ **If breathing rate, fever, and eating are the same**, change to the second-line antibiotic and advise the mother to return in 2 days or refer. (If this child had measles with in the last 3 months, refer).
- ❖ **If breathing slower, less fever, or eating better**, complete the 5 days of antibiotic.

## TEACH THE MOTHER TO GIVE ORAL DRUGS AT HOME

Follow the instructions below for every oral drug to be given at home.  
Also follow the instructions listed with the drug's dosage table.

- ❖ **Give Paracetamol for High Fever (> 38.5°C) or Ear Pain**
- ❖ Give paracetamol every 6 hours until high fever or pain is gone.

AGE or WEIGHT	PARACETAMOL	
	TABLET(100mg)	TABLET(500mg)
2 months up to 3 years (4-<14kg)	1	1/4
3 years up to 5 years(14-19kg)	1 1/2	1/2

- ❖ **Give Vitamin A**
  - ❖ Give two doses.
  - ❖ Give first dose in clinic.
  - ❖ Give mother one dose to give home the next day.

AGE	VITAMIN A CAPSULES			VITAMIN A syrup
	200 000 IU	100 000 IU	50 000 IU	Concen- tration: ____
Up to 6 months		1/2 capsule	1 capsule	
6 months up to- 12 months	1/2 capsule	1 capsule	2 capsule	
12 months up to- 5 years	1 capsule	2 capsule	4 capsule	



## Answer Key

### 2.1.1 For All Categories

- 2.1.1.1 E
- 2.1.1.2 A
- 2.1.1.3 E
- 2.1.1.4 True
- 2.1.1.5 E
- 2.1.1.6 False
- 2.1.1.7 Fast breathing and chest indrawing
- 2.1.1.8 C

### 2.1.2 Health Officer

- 2.1.2.1 a) Bacterial causes
  1. Streptococcus pneumoniae
  2. Hemophilus influenzae
  3. Streptococcus pyogenes
  4. Staphylococcus aureus
- 2.1.2.2 False
- 2.1.2.3 E
- 2.1.2.4 E
- 2.1.2.5 E
- 2.1.2.6 False
- 2.1.2.7 Fast breathing and Chest indrawing
- 2.1.2.8 E
- 2.1.2.9 a) True b) False c) True d) True e) True
- 2.1.2.10 E

### **2.1.3 Public Health Nurse**

- 2.1.3.1 C
- 2.1.3.2 B
- 2.1.3.3 C
- 2.1.3.4 E
- 2.1.3.5 E
- 2.1.3.6 E
- 2.1.3.7 E
- 2.1.3.8 B
- 2.1.3.9 E
- 2.1.3.10 B
- 2.1.3.11 E
- 2.1.3.12 False
- 2.1.3.13 True
- 2.1.3.14 True
- 2.1.3.15 False

### **2.1.4 Environmental Health Technicians**

- 2.1.4.1 E
- 2.1.4.2 B
- 2.1.4.3 A
- 2.1.4.4 D
- 2.1.4.5 D
- 2.1.4.6 a) Measles b) Pertussis
- 2.1.4.7 breast feeding health education and vitamin A supplementation
- 2.1.4.8 D

## **2.1.5 Medical Laboratory Technicians**

2.1.5.1 Gram staining of respiratory secretion  
Blood film to rule out haemo-parasites  
Pleural fluid analysis if there is para-pneumonic effusion or empyema

2.1.5.2 True

2.1.5.3 E

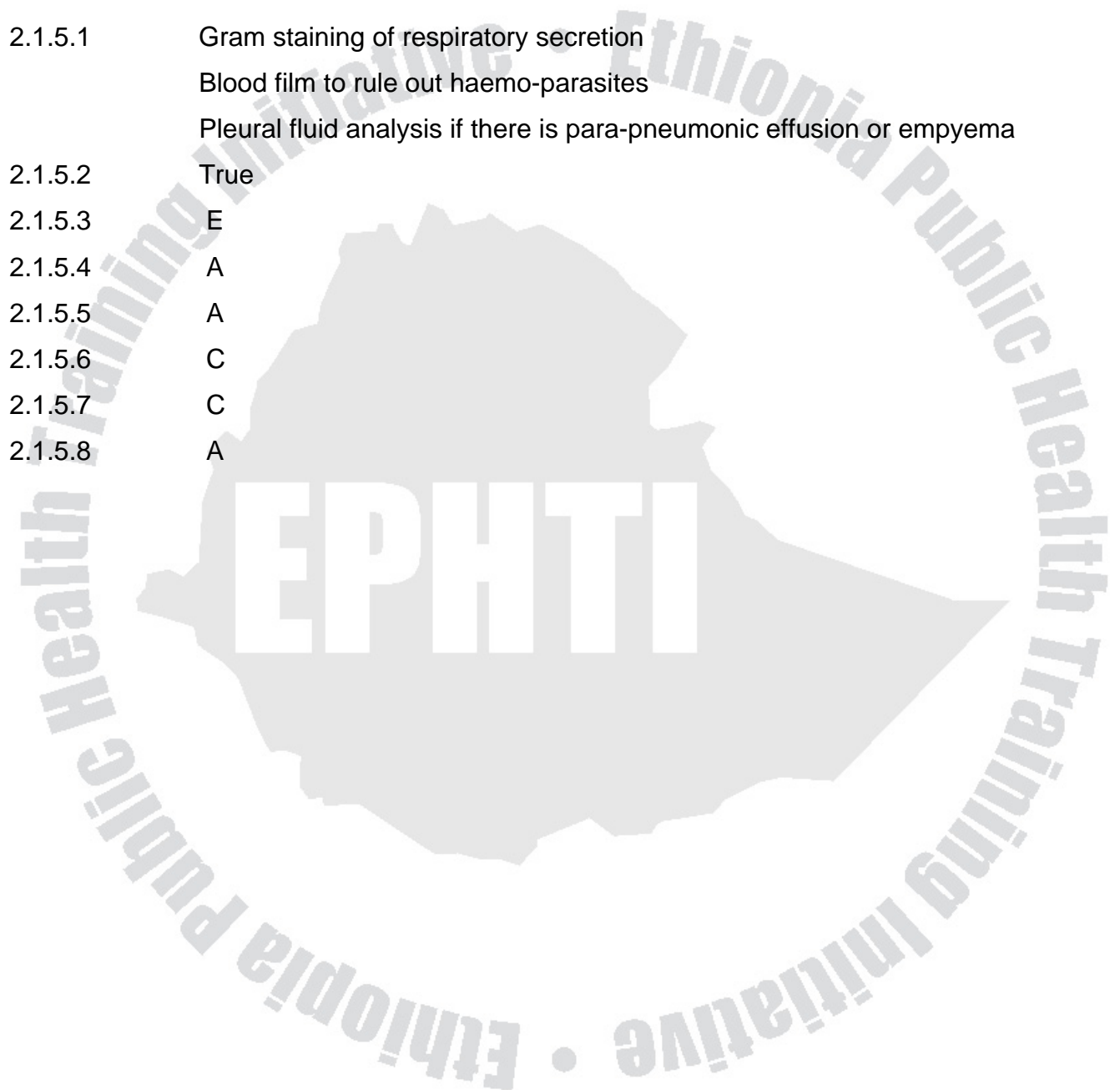
2.1.5.4 A

2.1.5.5 A

2.1.5.6 C

2.1.5.7 C

2.1.5.8 A



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