ESSENTIALS OF PHARMACY PRACTICE

A syllabus for selected courses in hospital pharmacy practice

July 2012

EPN
Ecumenical Pharmaceutical Network
Réseau Pharmaceutique Œcuménique

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SPS
Strengthening
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Ecumenical Scholarship Programme

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The production of the first edition (2011) of this syllabus would not have been possible without the support of the U.S. Agency for International Development, under the terms of cooperative agreement number GHN-A-00-07-00002-00, through the Strengthening Pharmaceutical Systems programme of Management Sciences for Health.
In 2012, the syllabus was revised with support from the Ecumenical Scholarship Programme (ESP) of Bread for the World, Germany after the Essentials of Pharmacy Practice (EPP) course was piloted in Nairobi.
The opinions expressed in this document are those of the Ecumenical Pharmaceutical Network and do not necessarily reflect those of Management Sciences for Health, the U.S. Agency for International Development, the United States Government, or Bread for the World.

About EPN

The Ecumenical Pharmaceutical Network (EPN) is a Christian, not for profit, independent organization committed to the provision of quality pharmaceutical services as a means to achieving global goals and targets on health and access to medicines. EPN has been strengthening pharmaceutical services in church health systems for over 30 years.

About the SPS programme

The Strengthening Pharmaceutical Systems (SPS) Programme strives to build capacity within developing countries to effectively manage all aspects of pharmaceutical systems and services. SPS focuses on improving governance in the pharmaceutical sector, strengthening pharmaceutical management systems and financing mechanisms, containing antimicrobial resistance, and enhancing access to and appropriate use of medicines.

Acknowledgments

EPN would like to express appreciation to Romuald Mbwasi for undertaking a significant portion of the development work. The following other people contributed either through preparatory work or review of the draft documents: Abimbola Oshin, Ashraf Kasujja, Enoch Osafo, Karin Wiedenmayer, Veronica Vugutsa, Emmanuel Higenyi, Mike Upio, Wilson Mlaki, Ursula Roemhild and John Carroll.
The second edition was developed with significant contribution from the Kenya Medical Training College (KMTC): Richard Kolute, Florence Nderitu, Josephine Wahito, Jacinta Mukonzo and Barnaba Kirui.

Second edition, July 2012 (first version, April 2011).

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TABLE OF CONTENTS

1. INTRODUCTION

Medicines are a major component of any health system and they often take up a significant portion of the health system budget. It would appear logical then that the management of medicines in any health system should be the responsibility of professionals trained especially for this. The sub-Saharan African Region is characterized by an acute shortage of health workers in general, but more so of qualified pharmaceutical personnel. Studies conducted by EPN in different countries between 2008 and 2010 showed that although many variations exist, the majority of health workers providing pharmaceutical services in faith-based health care facilities are neither pharmacists, pharmaceutical technicians nor technologists. A survey of 52 hospitals in Nigeria in 2009 (representing about 40% of the church hospitals in the country) revealed that only 33 institutions (63%) had a pharmacy professional in charge of the pharmacy[1]. In Malawi, a similar survey was done in 2008 in 97 church health facilities to document the qualifications of the staff working in the pharmacies. The study revealed that out of 48 hospitals, 37 (77%) did not employ anyone with formal training in pharmacy. Therefore, the need to provide basic pharmaceutical training to those staff who are currently working in these hospital pharmacies cannot be overemphasized. The course, **'Essentials of Pharmacy Practice'** is intended to bridge this gap by empowering pharmacy staff with relevant knowledge and skills towards improving the quality of pharmaceutical services.

1.1. Objectives

The overall objective of the course is to equip the candidates with basic theoretical knowledge and some practical skills to support the delivery of pharmaceutical services. Thus, at the end of the course, the candidate should be able to:

- Translate and implement theoretical concepts of pharmacy practice into day to day operations (essential medicines concept, dispensing, rational use of medicines and compounding)
- Identify basic medicines and understand their use in the management of common health conditions
- Understand and implement good medicine management practices
- Communicate effectively with patients and members of the health care team
- Implement basic standard operating procedures in pharmacy practice
- Use basic tools available from EPN and other organizations to improve the practice of pharmacy
- Understand the legal and regulatory aspects of pharmacy practice and uphold pharmacy ethics

1.2. Duration of the course

The course contains six modules and is designed to run for a total of 480 hours (12 weeks). The course is modular and it can be delivered either in one block session covering all six modules or in individual modules which are designed to run for two weeks.
If the course is offered in the module-by-module format, the order of the modules is flexible and the course can be started with any module. However, for an ideal flow of the content, it is advisable to follow the order of the modules.
For the final examination and certification, candidates should have successfully completed all modules within a 3 year period.

[1] *EPN HR mapping studies, available* http://www.epnetwork.org/hr-mapping-studies

1.3. Entry requirements

The prospective candidates for the course are persons with some basic training in any medical field or any other persons with basic formal education (usually 12 years) and already working in a hospital pharmacy. Good command of English language is a necessary requirement (this course is also available in French).
Staff who have formal training in pharmacy may benefit from selected units or modules since the emphasis of the course is on applied skills and knowledge. Staff employed at primary health care level and working in pharmacy units also stand to benefit from the course.

1.4. Teaching methodology

The training methodology will be highly participatory and will include tutorials, group discussions, practical class demonstrations, role-plays, assignments and field visits.

1.5. Examination

The candidates will be assessed through continuous assessment tests which may include class exercises and assignments. At the end of each module, a written examination shall be administered. Upon successful completion of the whole course, a comprehensive final examination integrating material from all the modules shall be done for certification.

1.6. Course modules

The table below highlights the course modules per block, the various units per module and the duration of each unit.

Table 1: Course modules

Module	Units	HRS
ONE	**PHARMACY AND HEALTH CARE**	**72**
	Course introduction	2
	1. Primary health care and health care delivery systems	12
	2. The role of pharmacy and pharmacy personnel in health care	8
	3. Essential medicines concept	14
	4. Communication skills	36
TWO	**FUNDAMENTALS OF PHARMACEUTICS**	**72**
	5. Weights, measures, equipment and reference materials	12
	6. Pharmaceutical formulations	12
	7. Basic pharmaceutical calculations	30
	8. Reconstitution of dry powders	4
	9. Hospital-based production (including visit to hospital production site)	14
THREE	**MEDICINE SUPPLY MANAGEMENT**	**72**
	10. Medical commodity management	4
	11. Medicine selection	3
	12. Medicine procurement	16
	13. Receiving medicines	4
	14. Managing distribution systems in the hospital	8
	15. Managing inventory	12
	16. Stores management	11
	17. Quality assurance of medicines	6
	Field visit supply agency	8

Module	Units	HRS
FOUR	**BASIC THERAPEUTICS**	**72**
	18. Overview and medicine use in various body systems	40
	19. Medicines for special public health problems	12
	20. Anti-infectives	12
	21. Medicine use for special conditions	8
FIVE	**RATIONAL MEDICINE USE AND DISPENSING**	**72**
	22. Understanding rational medicine use	24
	23. Dispensing environment	6
	24. Prescription management and dispensing	24
	25. Pharmacovigilance	8
	26. Medicine donations	4
	Field visit hospital pharmacy	6
SIX	**HOSPITAL PHARMACY PRACTICE**	**64**
	27. EPN guidelines for effective and efficient provision of pharmaceutical services	16
	28. EPN standards on hospital pharmacy practice	8
	29. Standard operating procedures	12
	30. Ward pharmacy services	4
	31. Records management and pharmacy information systems	12
	32. Legal and regulatory framework for pharmacy practice	8
	33. Ethical aspects of pharmacy practice	4
Tests, Revision and Final Examination		**56**

1.7. Attendance

It is desired that the candidate should attend each and every session of each module. Any candidate who has less than 85% of contact hours for a particular module will not be allowed to sit the modular exam.

1.8. Assessment

The following shall be the assessment conditions:

1. In every module, candidates shall be assessed continuously through exercises, assignments and homework.
2. At the end of the module, candidates shall be given an end of module examination which will carry a total of 100 marks and will have a pass mark of 50%.
3. Any candidate who fails to attain the pass mark in a particular module, shall be required to sit a supplementary examination for the respective module.
4. Any candidate who fails a supplementary examination for a particular module, shall be required to repeat the module and be examined again.
5. After successful completion of the 6 modules, candidates shall undertake an end of the course examination that will cover materials from all six modules. This exam will also carry 100 marks and will have a pass mark of 50%.
6. Those who fail to get the pass mark shall be given one chance to repeat the examination. Failure to pass will make the candidate ineligible for certification.

1.9. Grading

The grading system shall be as follows:

Marks Range	Grade	Remarks
80 - 100%	A	Distinction
65 - 79%	B	Credit
50 - 64%	C	Pass
0 - 49%	F	Fail

1.10. Practical attachment

There shall be no practical attachment; however the candidates doing the course in a modular format shall be given assignments at the end of each training module to do at their respective work stations to strengthen their knowledge.
All candidates shall be encouraged to share their experiences in class as practical examples from the field.

1.11. Certification

- A **'Certificate of Attendance'** shall be awarded to a candidate who has successfully completed a particular module.
- A **'Certificate in Essentials of Pharmacy Practice'** shall be awarded to a candidate who has successfully completed the full course.
- The individuals and hospitals who invest in this course do so because of the value attached to improving working skills for provision of quality health care. This certificate does not aim for recognition by any professional or regulatory body of the particular country.

1.12. Position and legal status in the hospital

The candidates awarded the 'Certificate in Essentials of Pharmacy Practice' are expected to be assigned duties in line with their qualifications and experience. The certification under this programme confirms that the candidate has acquired basic skills and knowledge in pharmacy. It is not a formal or recognised academic qualification. The hospital that invests in sending their staff for this course will still be expected to employ other staff in line with the national laws and regulations on the cadres of health professionals who can provide hospital pharmacy services.

1.13. Book list

The following books are recommended for use by the candidates in this course

- Where there are no pharmacists. A guide to managing medicines for health workers. 2010
- WHO Model Formulary. 2008
- WHO Model Formulary for Children. 2010
- British National Formulary, BNF and/or equivalent National Drug Index where applicable
- Guidelines for storage of essential medicines and other health commodities. JSI/Deliver 2006.
- Guidelines for drug donations. Revised 1999. WHO, 1999
- EPN guidelines on effective and efficient pharmaceutical services. EPN, 2012.
- Pharmacy practice in church health institutions. Minimum standards for hospitals. EPN, 2010.

2. MODULE 1: PHARMACY AND HEALTH CARE (72 HRS)

2.1. Introduction

Provision of health care is a complex undertaking that involves multidisciplinary teams carrying out several interventions to reach the desired health outcomes. Understanding the interrelationship between policy makers and other health stakeholders is vital for efficient delivery of health services, and therefore an introduction to the health system and its relation to pharmacy practice is important. However, each health system is unique and the policies and practices in one country may be completely different in another. This module will focus on general principles that may apply across most countries but the candidates must be ready to adapt to the specific conditions in their area of practice. Furthermore, the success of the concept of essential medicines which is a key component of this module depends very much on support of the policy makers. Good medicine policy is characterized, among others, by the existence of a national essential medicines list, standard treatment guidelines and national formularies. This module provides the candidates with a broad overview on health systems and medicines policy as well as equipping them with communication skills that are critical for their work.

2.2. Aim

At the end of this module, the candidate will:

- Be able to discuss health care systems
- Understand the primary health care concept
- Understand the essential medicines concept
- Be informed about national medicines policy
- Be able to describe the importance and use of standard treatment guidelines and national formularies
- Understand the role of the pharmacy and pharmacy personnel in health care
- Be able to communicate effectively with clients, patients and other health staff

2.3. Introductory session (2 hrs)

This session is intended to give the candidates a quick overview over the course content and discuss logistical issues for the course. Class representatives can be elected during this session and other tasks given out.

2.4. Unit 1: Primary health care and the health care delivery system (12 hrs)

Objectives

At the end of this unit, the candidate should be able to:

- Understand a health system
- Understand the concept of primary health care in the society
- Describe the roles of the different players (government, faith-based, private sector) in health care delivery
- State the levels of health care delivery in the country
- Understand common models of health care financing
- Understand the barriers to health care
- Discuss health and wholeness and spiritual dimensions of health and healing
- Understand health promotion

Contents

1. What is a health system?

- Different types of health care systems
- Determinants, goals and building blocks of a health system
- Role of the government and the private sector in health care

2. The concept of primary health care (PHC)
   - Definition and goals of PHC
3. Levels of health care delivery
   - Classification system
   - Patient referral system
4. Financing health care (basics)
   - Sources of health care financing
   - Mechanisms of health care financing
5. Barriers to quality health care
6. Prevention of illness and health promotion
   - Principles and approaches of health promotion
   - Pharmacy strategies for health promotion
7. Health and wholeness
   - Concepts of health in society
   - Health dimensions
   - Individual's and community's participation in health

2.5. Unit 2: The role of pharmacy and pharmacy personnel in health care (8 hrs)

Objectives

At the end of this unit, the candidate should be able to:

- Discuss the role of the pharmacy department in the provision of health care in the hospital
- Describe the role of the pharmacy personnel in health care delivery and collaboration with other health staff
- Discuss the roles of hospital teams and committees

Contents

1. The hospital as an institution, its purpose, governance and different departments
2. The pharmacy profession in health care
   - Dimensions of pharmacy practice
3. The pharmacy department
   - Organisation and functions
   - Duties and responsibilities of pharmacy personnel
   - Pharmaceutical cadres
4. Hospital technical and managerial teams and committees
   - Common hospital teams and committees
   - Composition and basic functions
   - Role of pharmacy personnel in health care teams

2.6. Unit 3: Essential medicines concept (14 hrs)

Objectives

At the end of this unit, the candidate should be able to:

- Understand the essential medicines concept (EMC)
- Understand the national medicines policy
- Describe the importance and use of standard treatment guidelines and national formularies

Contents

1. Definition of essential medicines concept
   - Background and evolution of the concept – the Alma-Ata declaration
   - The role of WHO
   - Selection criteria for essential medicines
2. EMC and pharmacy practice
   - Generics versus brands
   - Counterfeit medicines
   - National essential medicines lists (EML)
3. Standard treatment guidelines (STGs) and medicines formularies
   - Contents and advantages of STGs
   - Function and types of formularies
4. Approaches to developing, updating and implementing EML, formularies and treatment guidelines
5. National medicine policy
   - Objectives and key elements of a national medicine policy

2.7. Unit 4: Communication skills (36 hrs)

Objectives

In this unit the candidate will acquire basic knowledge and skills in verbal and written communication that will improve the quality of services being provided to patients and result in better health outcomes.

At the end of this unit, the candidate should be able to:

- Discuss the methods and importance of communication in the work place
- Describe different communication skills
- State common communication barriers and ways to overcome them
- Discuss the role of attitude, culture, beliefs and values in communication
- Communicate confidently with other members of the health team
- Counsel patients on medicines and health matters in an appropriate way
- Prepare written communication to other hospital units

Contents

1. What is communication?
2. Forms of communication
3. Effective communication
4. Communication skills
5. Basic principles of effective communication
6. The importance of communication in the work place
7. Barriers to effective communication
8. Effect of attitude, culture, beliefs and values in communication
9. Counselling approaches in medicine use and health
   - GATHER approach (**G**reet, **A**sk, **T**ell/explain/discuss, **H**elp, **E**xplain/provide information and instructions, **R**eturn/discuss follow-up date or referral)
10. Use of 'open-ended' questions in patient care
11. Patient involvement in deciding approaches to treatment
12. Written communication in the hospital setting
13. Supporting patients' treatment

3. MODULE 2: FUNDAMENTALS OF PHARMACEUTICS (72 HRS)

3.1. Introduction

Many times the pharmacy staff is required to carry out some basic calculations while managing medicines and compounding pharmaceutical preparations. To perform this accurately and efficiently, the candidate needs to have some basic skills. This module aims at providing the candidate knowledge and skills on commonly encountered basic calculations in dispensing and compounding. Basic pharmaceutical formulations, packaging and medicine stability as well as basic knowledge and skills in compounding are also covered.

3.2. Aim

At the end of this module, the candidate should be able to:

- Name and use the units of measures and weights commonly used in pharmacy practice
- Discuss the basics of pharmaceutical formulations including appropriate storage and transportation
- Carry out basic pharmaceutical calculations during dispensing and compounding
- Correctly use the different equipment and devices used in dispensing and compounding
- Identify and use various reference materials for dispensing and compounding
- Carry out compounding of basic extemporaneous medicines

3.3. Unit 5: Weights, measures, equipment and reference materials (12 hrs)

Objectives

At the end of this unit, the candidate should be able to:

- Name the units of measure and weights commonly used in the dispensing of medicines in the hospital
- Identify the symbols of measures often used in pharmacy practice
- Indicate the relationship within each type of unit
- Choose and appropriately use the various equipment and devices in dispensing and compounding medicines
- Identify and appropriately refer to the various sources of information as a pre-requisite for dispensing and compounding

Contents

1. Weights and measures – Units and symbols of measure
2. International units (IU)
3. Equipment and devices used in dispensing and compounding
4. Reference materials for dispensing and compounding

3.4. Unit 6: Pharmaceutical formulations (12 hrs)

Objectives

At the end of this unit, the candidate should be able to:

- Describe the different types of pharmaceutical formulations and their routes of administration
- Outline the factors that govern the choice of the dosage form used in patient medicine management
- Describe stability and the generally recommended storage conditions for various pharmaceutical formulations
- Describe the role of the various formulation additives in dosage forms

Contents

1. Introduction to pharmaceutical formulations
2. Types of pharmaceutical formulations (including newer formulations like dispersible tablets)
3. Additives in pharmaceutical formulations
4. Stability of pharmaceutical formulations, storage conditions and transportation

3.5. Unit 7: Basic pharmaceutical calculations (30 hrs)

Objectives

At the end of this unit, the candidate should be able to:

- Carry out basic pharmaceutical calculations often encountered in pharmacy practice
- Calculate quantities of medicines to be dispensed per prescription
- Convert volumes, weights and lengths to their equivalent metric units
- Calculate quantities of ingredients required to compound a product based on a standard formula
- Interpret and calculate percentage strength, ratio strength and parts per million concentrations
- Carry out dilutions of concentrated solutions
- Carry out basic dose calculations (posology) for various age groups

Contents

1. Introduction to calculations
    - Percentage strength, ratio strength, proportions and parts per million (ppm) concentrations
    - Common conversions
2. Concentrations and dilutions (Liquid preparations and antiseptics/disinfectants)
3. Enlarging and reducing formulas
4. Ratio proportion calculations involving solution dosage forms
5. Dosage calculations (posology)
    - Dosage calculations for oral medications
    - Dosage calculations for injections
    - Dosage calculations based on age, body weight and body surface area

3.6. Unit 8: Reconstitution of dry powders (4 hrs)

Objectives

At the end of this unit, the candidate should be able to:

- Define the terms related to dry powder formulations
- Understand and interpret manufacturers' instructions on dry powder product containers
- Calculate and accurately measure the quantity of diluent required for reconstitution
- Calculate the dose required based on the prescription/medical order
- Provide accurate dosing instructions to customer/patient
- Explain the stability of dry powders vis-à-vis liquid formulations

Contents

1. Required characteristics for powders
2. Techniques of reconstitution of oral medicines
3. Techniques of reconstitution of dry powders for injection
4. Labelling of reconstituted medicines

3.7. Unit 9: Hospital-based production (14 hrs)

Objectives

At the end of this unit, the candidate should be able to:

- Manage the production environment and keep it clean and tidy
- Discuss basic compounding, sterile preparation and other production techniques
- Select appropriate equipment and ingredients for compounding
- Carry out basic compounding of simple formulations
- Document the production process and keep production records
- Apply aseptic technique during production of sterile products and the clean room concept

Contents

1. Introduction and definition of common terms
   - Extemporaneous preparations
   - Compounding
   - Non sterile production
   - Sterile production
2. Production formulae
   - Components of formulae
   - Interpretations and referencing
   - Containers, labelling and storage of finished products
3. Compounding techniques in hospital pharmacy set-up (with field visit for practical demonstrations of the different techniques)
   - Incorporation
   - Trituration
   - Mixing
   - Grinding – size reduction
   - Solution preparation
   - Aseptic technique

4. MODULE 3: MEDICINE SUPPLY MANAGEMENT (72 HRS)

4.1. Introduction

Medicine supply management addresses how people involved at different levels can work, plan and organize a supply system to ensure that high-quality essential medicines and supplies are available, accessible, affordable and rationally used. Medicines have particular importance as they can save lives, improve health and promote trust in the health system; they take up a substantial amount of the budget of a hospital and increase client participation in health care services. It is therefore important for those working in the pharmacy at any level to have some basic knowledge and skills on medicine supply management.

4.2. Aim

At the end of this module, the candidate should be able to:

- Discuss the medicine management cycle
- Understand the basics of quantifying medicine needs for a hospital
- Understand the basics of medicine procurement for the hospital
- Receive medicines and supplies in the hospital
- Describe and manage a hospital medicine distribution system
- Discuss and apply good storage practices and manage a medicine storage facility in a hospital
- Describe and manage medicine inventory system including security system to reduce pilferage
- Understand the importance of medicine quality assurance/control in a hospital environment

4.3. Unit10: Medical commodity management (4 hrs)

Objectives

At the end of this unit, the candidate should be able to:

- Discuss the medicine supply management cycle and its components
- Understand the benefits of an effective medicine supply management system
- Discuss the implications of poor medicine management

Contents

1. Rationale for supply management of medical commodities (basic)
2. Why manage medicine supply
    - Financial objectives
    - Operational objectives
    - Customer service objectives
    - Health objectives
    - Benefits of efficient medicine supply management system to patients and facility
    - Implications of inefficient medicine supply management system
3. Components of the medicine management cycle (will be covered in subsequent units)
    - Selection
    - Procurement
    - Distribution
    - Management support
    - Policy and legal framework

4.4. Unit 11: Medicine selection (3 hrs)

Objectives

At the end of this unit, the candidate should be able to:

- Discuss the importance of medicine selection in hospital settings
- Explain the criteria for medicine selection
- Understand the benefits of having an essential medicines list, standard treatment guidelines and a hospital formulary
- State the process of medicine selection in hospital settings

Contents

1. The process, criteria and rationale for medicine selection in hospitals

4.5. Unit 12: Medicine procurement (16 hrs)

Objectives

At the end of this unit, the candidate should be able to:

- Discuss the basic procurement cycle
- Discuss procurement methods commonly used by hospitals
- Discuss good procurement practices in the hospital context
- Carry out basic medicine quantification for the hospital

Contents

1. The procurement cycle and procurement methods
   - The procurement cycle and factors to consider during the process
   - Tenders (open, restricted and single source)
   - Competitive negotiation
   - Sole source commitment
   - Direct procurement
2. Procurement tools
   - Product record
   - Stock card
   - Monthly report and requisition form
   - Requisition and issue voucher
   - Delivery form
   - Discrepancy form
3. Good procurement practices
   - Use of generic names, EML and formularies
   - Bulk procurement
   - Supplier selection
   - Separation of key functions and involvement of medicines & therapeutic committees
   - Product quality assurance
   - Benefits of GPP
4. Quantification of medicine needs in hospital settings
   - The necessity of quantification and the importance of having accurate medicine consumption data for the hospital
   - Terms used in quantification
   - Basic quantification methods
     - Consumption method
     - Morbidity method
   - Preparing for quantification

5. Prioritising in procurement
    - Prioritising in selection versus procurement
    - VEN classification
    - ABC classification
6. Documentation in medicine purchasing

4.6. Unit 13: Receiving medicines (4 hrs)

Objectives

At the end of this unit, the candidate should be able to:

- Describe receiving procedures of medicine consignments at the hospital
- Understand how to implement the basic checks for receipt of a medicine consignment
- Discuss the importance of documentation when receiving medicine consignments

Contents

1. Receiving medicines at the hospital
    - Receiving procedures and checklist
    - Handling discrepancies
    - Documentation of medicine consignment receipts
2. Receipt of consignments that require special handling: cold chain medicines, narcotics, vaccines
3. Legal implications of signed receipts

4.7. Unit 14: Managing distribution systems in the hospital (8 hrs)

Objectives

At the end of this unit, the candidate should be able to:

- Describe the main objectives of medicine distribution in the hospital
- Describe the medicine distribution methods commonly applied in hospital settings
- Understand how to set up distribution centres in hospital settings
- Describe how to manage distribution systems in hospital settings

Contents

1. Introduction to medicine distribution
    - Distribution cycle
    - Good distribution practices
2. Distribution methods in hospital settings
    - Push and pull system
    - Collection and delivery system
    - Bulk ward supply system
    - Individual medicine order system
    - Unit dose system
    - Outpatient supply system
    - Repackaging of medicines
3. Control and monitoring medicine distribution in hospital settings
4. Satellite pharmacy as user point

4.8. Unit 15: Managing inventory (12 hrs)

Objectives

At the end of this unit, the candidate should be able to:

- Define basic terms used in inventory management

- State the objectives of inventory management
- Maintain basic inventory control records
- Discuss the benefits of a good inventory system and common inventory management problems
- Discuss the importance of information technology in inventory management in hospital settings
- Discuss the disposal procedures for unwanted medicines

Contents

1. Introduction to inventory management in hospital settings
    - Basic concepts in inventory management (lead time, service level, safety stock, stock consumption)
2. Definitions: stock, inventory, bin card, ledger
3. Basics of inventory costs and how to control them
4. Inventory control records and documentation
    - Requisition/receiving documents
    - Stock control reports (stock position, inventory value, consumption patterns, expiry status, obsolete stock)
    - Importance of inventory management
    - Security breaches
    - Budgeting, planning and reporting
5. Common inventory problems
    - Types of inventory control problems
    - Stock-outs, stock expiry, stock losses
    - Implications of stock control failure
    - Resolving and prevention of inventory problems
6. Management of unusable pharmaceuticals
    - Causes of unusable stock
    - Problems due to presence of unusable stock
    - Disposal of medicines (regulations and methods

4.9. Unit 16: Stores management (11 hrs)

Objectives

At the end of this unit, the candidate should be able to:

- State the importance of good store keeping
- Describe a good storage system
- Describe how to manage a medicine storage facility
- Describe how to maintain a clean environment in the storage facility
- Describe how to set up a monitoring and security system for stocks

Contents

1. Definition and introduction to good store keeping
    - Factors to consider (security, space, store organisation, storage conditions)
2. Tools and equipment for medicine storage
3. Storage conditions for different products
    - Products stored at normal room temperatures and cold storage
    - Products requiring special storage conditions: narcotics, flammables, corrosives
4. Organizing stock in the medicine store room
    - Stores arrangement
    - Stock rotation

- Stock classification

5. Store cleaning and pest control
6. Setting up a pharmacy store
   - Location
   - Design
   - Waste management

4.10. Unit 17: Quality assurance of medicines (6 hrs)

Objectives

At the end of this unit, the candidate should be able to:

- Define and differentiate between quality assurance (QA) and quality control (QC)
- Describe the importance of quality assurance for medicines at hospital level
- Describe the basic factors contributing to poor medicine quality at hospital level
- Describe how to set up basic procedures for medicine quality assurance at hospital level

Contents

1. Introduction to medicine quality assurance in hospital settings
   - The importance of medicine quality assurance in hospital settings
2. Factors contributing to poor medicine quality in hospitals and the implications of poor quality
3. Setting up a medicine quality assurance system in a hospital
   - QA system in the hospital
   - GPHF Minilab

4.11. Field visit supply agency (8 hrs)

Objectives

The objective of the field visit is for candidates to observe and understand how the concepts in medicine supply management are applied in a supply agency. The practical example of a supply agency is intended to help candidates implementing those concepts in their work stations and their daily work. Furthermore candidates will be able to understand how supply agencies work and adapt their work procedures so as to facilitate smooth ordering processes.

5. MODULE 4: BASIC THERAPEUTICS (72 HRS)

5.1. Introduction

A basic understanding of therapeutics builds up a strong awareness that can be effectively used in dispensing and patient counselling. This knowledge gives the dispenser confidence to provide basic advice to patients and the community on correct use of medicines, therefore increasing her/his contribution to the health care team. This module aims at introducing the candidate to common therapeutic groups of essential medicines and their use to treat common diseases.

5.2. Aim

The aim of this module is to equip the candidate with basic knowledge on selected essential medicines and therapeutic groups and an appreciation of their linkage to the management of common diseases.

At the end of this module, the candidate should be able to:

- Discuss the indications of selected essential medicines
- Relate essential medicines to the treatment, management and control of common diseases

5.3. Unit 18: Overview and medicine use in various body systems (40 hrs)

Objectives

At the end of this unit, the candidate should be able to:

- Describe the role and limitations of medicines in the management of health conditions
- Discuss the use of selected medicines in the management of common diseases/conditions affecting various body systems

Contents

1. Introduction to medicines and their use in health care
    - What are medicines?
    - Various sources of medicines
    - Pharmacological classification of medicines
    - Pharmaceutical preparations
    - Goals to therapy
2. Introduction to commonly used terminologies in pharmacy and therapeutics
    - Pharmacy
    - Pharmacology
    - Medicines and drugs
    - Tolerance
    - Accumulation
    - Toxic effect
    - Habituation, dependence, addiction
    - Medicine resistance
    - Medicine combinations
    - Medicine interactions
    - Side effects
    - Adverse medicine reactions
    - Dose
    - Over-the-counter medicines
    - Medicine allergy/hypersensitivity

3. Routes and techniques of medicine administration
    - Oral
    - Buccal
    - Rectal
    - Parental
    - Transdermal
    - Inhalation
    - Nasal
    - Topical
    - Vaginal
    - Medicine administration aids (dropper, spacer, nebuliser, pessary applicator, tablet cutter)
4. Processes in the body after medicine administration
    - Absorption
    - Distribution
    - Metabolism
    - Excretion
    - Factors affecting processes after medicine administration
5. Medicines acting on the cardiovascular system
    - Antihypertensives
    - Anti anginal medicines
    - Anti arrhythmic medicines
    - Medicines used in heart failure
    - Antithrombotic medicines
    - Lipid lowering medicines

      (Actions, indications, contraindications, interactions, adverse effects and recommended dosages of essential medicines for the common conditions)
6. Medicines acting on the endocrine system
    - Introduction to the endocrine system
    - Hormones and medicines for endocrine disorders
    - Antidiabetic medicines
    - Reproductive system and oral contraceptives

      (Actions, indications, contraindications, interactions, adverse effects and recommended dosages of essential medicines for the common conditions)
7. Medicines acting on common nervous system health problems
    - Introduction to the nervous system
    - Analgesics
    - Anaesthetics
    - Antiepileptics
    - Psychotropic medicines
    - Antiemetics

      (Actions, indications, contraindications, interactions, adverse effects and recommended dosages of essential medicines for the common conditions)
8. Medicines acting on the gastrointestinal system
    - Introduction
    - Antacid and anti-ulcer medicines
    - Laxatives
    - Medicines used in diarrhoea

      (Actions, indications, contraindications, interactions, adverse effects and recommended dosages of essential medicines for the common conditions)

9. Medicines acting on the respiratory system
    - Introduction
    - Anti-asthmatics
    - Antitussives, expectorants and mucolytics
      (Actions, indications, contraindications, interactions, adverse effects and recommended dosages of essential medicines for the common conditions)

5.4. Unit 19: Medicines for special public health problems (12 hrs)

Objectives

At the end of this unit, the candidate should be able to:

- Discuss the use of selected medicines in the management of HIV, TB and malaria
- Discuss methods available to prevent the spread of these infections

Contents

1. Anti-retroviral agents
    - Introduction to HIV and AIDS
    - Classes of anti-retrovirals (ARVs)
    - Guidelines for antiretroviral treatment
    - Side effects
    - Medicine interactions
    - Adherence
    - Nutrition and HIV/AIDS
    - Medication use counselling
    - Stigmatisation and privacy
    - Public health and HIV prevention
2. Medicines for malaria
    - Introduction to malaria
    - Malaria treatment guidelines
    - Malaria prevention
    - Management of malaria in pregnancy
3. Medicines for tuberculosis (TB) and leprosy treatment
    - Introduction to TB
    - Common TB medicines
    - TB and leprosy medicine regimens
    - Treatment compliance and strategy for overcoming resistance
    - Importance of public health education to prevent TB and leprosy infections

5.5. Unit 20: Anti-infectives (12 hrs)

Objectives

At the end of this unit, the candidate should be able to:

- Discuss the use of selected medicines in the management of common infections

Contents

1. Introduction to anti-infective medicines
2. Antibacterial agents
3. Antifungal medicines
4. Antiprotozoal medicines
5. Antiviral medicines

6. Antihelminthics
   (Actions, indications, contraindications, interactions, adverse effects and recommended dosages of essential medicines for the common conditions)

5.6. Unit 21: Medicine use for special conditions (8 hrs)

Objectives

At the end of this unit, the candidate should be able to:

- Discuss commonly used antiallergics, antiseptics and disinfectants
- Discuss special considerations for use of medicines for children and during pregnancy

Contents

1. Antiallergics
   - Introduction to allergic reactions
   - Anti-histamine medicines
   - Adrenaline
   - Corticosteroids

   (Actions, indications, contraindications, interactions, adverse effects and recommended dosages of essential medicines for the common conditions)
2. Antiseptics, disinfectants and infection control
3. Medicine use in pregnancy
4. Medicines for children
   - Special considerations in selecting and dispensing medicines for children
   - Children's formulations e.g. dispersible tablets, suppositories, suspensions
   - Advocacy for more children's formulations

6. MODULE 5: RATIONAL MEDICINE USE AND DISPENSING (72 HRS)

6.1. Introduction

If medicines are finally irrationally used all the effort previously made in selecting, purchasing, storing and dispensing them becomes of no use. It is therefore important that each pharmacy staff has some basic understanding of the rational use of medicines concept. Dispensing refers to the preparation, counselling and handing out of medicines to patients. In the hospital setting, dispensing is normally based on a prescription written by an authorized prescriber. In the process of treatment, a dispenser sees the patient at the end of the whole process of patient management. Out-patients are actually on their way out of the hospital. For this matter, dispensing takes special importance, because if not properly done, treatment may not be successful. It is therefore important that those assigned to dispense medicines have sufficient knowledge and skills to achieve good health outcomes.
Sections on pharmacovigilance and medicine donations have also been included in this module.

6.2. Aim

At the end of this module, the candidate should be able to:

- Understand factors underlying the irrational use of medicines and its adverse impact
- Support strategies to improve medicine use in the hospital
- Discuss and apply good dispensing procedures and pharmaceutical terminologies commonly used in dispensing
- Prepare medicines for dispensing (including repackaging from bulk packs)
- Document and keep accurate records of dispensing
- Maintain and manage the dispensing environment
- Understand the importance of pharmacovigilance and the role it plays in improving patient care
- Discuss issues related to medicines donations

6.3. Unit 22: Understanding rational medicine use (24 hrs)

Objectives

At the end of this unit, the candidate should be able to:

- Discuss the medicine use process
- Discuss adherence and compliance to therapy
- Define rational use of medicines
- Discuss the factors underlying irrational use
- Discuss the impact of irrational use to patients, hospitals and the public
- Discuss ways of improving rational use of medicines

Contents

1. Introduction to medicine use
    - Different uses of medicines
    - Medicine use process
    - Importance of adherence to treatment
2. Definition of rational medicine use
3. Irrational use of medicines
    - Examples of irrational use
    - Irrational use and the different steps in the medicine use process
4. Factors underlying irrational use of medicine

5. Impact of irrational use of medicines
    - Quality of drug therapy and medical care
    - Cost and financial resources
    - Psychosocial impact
    - Antimicrobial resistance
6. Improving rational use of medicine
    - Role of Medicines and therapeutic committees
    - Strategies to improve the use of medicines (educational, managerial, and regulatory strategies)
    - Choose an intervention, and develop and implement a strategy
7. Field experiences related to rational use of medicines from candidates
    - Examples of irrational use of medicines experienced at the hospital
    - Examples of efforts taken at the hospital to improve rational use of medicines

6.4. Unit 23: The dispensing environment (6 hrs)

Objectives

At the end of this unit, the candidate should be able to:

- Describe a good dispensing environment
- Discuss the management and maintenance of a clean dispensing environment
- Discuss hindrances to good dispensing arising from the dispensing environment

Contents

1. Good dispensing environment
2. Environmental hindrances to good dispensing
3. Features of a good dispensing environment
    - Physical surroundings
    - Shelving and storage areas
    - Equipment and packaging material
    - Dispensing staff
    - Arrangement of medicines and equipment
    - Patient's privacy
4. Maintaining a clean environment

6.5. Unit 24: Prescription management and dispensing (24 hrs)

Objectives

At the end of this unit, the candidate should be able to:

- State the meaning and purpose of a prescription
- State the types of prescriptions
- Outline and categorize the information on a prescription
- Interpret the terms and abbreviations commonly used in prescription writing
- Screen a prescription and accurately assess for completeness
- Identify special patient care needs on the prescription
- Identify situations that need the attention of a higher level professional
- Identify special requests on a prescription
- Identify irrational prescriptions and take necessary steps

Contents

1. What is a prescription?
    - Definition of a prescription
    - Purpose of a prescription
    - Types of prescriptions
    - Information on prescriptions
2. Commonly used terms and abbreviations in dispensing and prescriptions
3. Guidelines for good dispensing practices
    - Receiving a prescription
    - Interpreting a prescription and checking for correctness of the interpretation
    - Filling of a prescription
    - Packaging and labelling
    - Giving instructions to the patient and counselling
4. Prescription refills
5. Prescription retention and documentation/dispensing records
6. Sources of medicines information
    - Medicines promotion
    - Formularies
7. Dispensing practice (role plays)

6.6. Unit 25: Pharmacovigilance (8 hrs)

Objectives

At the end of this unit, the candidate should be able to:

- Discuss pharmacovigilance and its importance in monitoring adverse medicine events
- Collect and document patients complaints (allergies, side effects)
- Understand the importance of reporting adverse medicine reactions (ADRs)
- Correctly complete adverse medicine reaction (ADR) forms and submit them to respective authorities

Contents

1. What is pharmacovigilance?
    - Definition
    - Background
    - Aims
    - Importance
    - Key players
    - Regulatory bodies in medicines control
2. Pharmacovigilance and adverse medicine reactions
    - Sources of adverse medicine reactions
    - Classification
    - How to recognise and detect adverse medicine reactions
3. The national pharmacovigilance system – reporting of adverse medicine reactions

6.7. Unit 26: Medicine donations (4 hrs)

Objective

At the end of this unit, the candidate should be able to:

- Describe the basic concept of medicine donations
- Know how to handle donations to have positive impact on health
- Solve various problems associated with donations

Contents

1. Basic guidelines on medicine donations
    - Problems with donations and the need for guidelines
    - Core principles and guidelines for donations
2. Common types of medicine donations received in hospitals

6.8. Field visit hospital pharmacy (6 hrs)

Objectives

The objective of the field visit is for candidates to observe and link the theoretical knowledge they have gained during the module to the practical example of a hospital pharmacy. Special attention should be paid to the hospital pharmacy set-up, the store and stores management, dispensing and prescription management. The field visit will help candidates to apply discussed concepts and practices in their work stations.

7. MODULE 6: HOSPITAL PHARMACY PRACTICE (64 HRS)

7.1. Introduction

This module presents the information required for the day to day practice of hospital pharmacy and addresses the environment in which this practice has to be carried out. Topics include the EPN Guidelines for effective and efficient pharmaceutical services, the EPN Standards of hospital pharmacy practice and pharmacy ethics. The module also introduces the issue of Standard operating procedures (SOPs), pharmacy regulations, regulatory agencies and legislation, and ethical aspects of pharmacy practice.

7.2. Aim

At the end of this module, the candidate should be able to:

- Explain the use and importance of the EPN Guidelines for effective and efficient pharmaceutical services
- Discuss EPN standards of hospital pharmacy practice
- Explain the legal and regulatory framework governing pharmacy practice in the country
- Describe the basic ethical aspects of pharmacy practice

7.3. Unit 27: EPN Guidelines for effective and efficient pharmaceutical services (16 hrs)

Objective

At the end of this unit, the candidates should be able to:

- Understand importance of EPN Guidelines
- Understand the rationale for EPN Guidelines
- Measure compliance for the EPN Guidelines
- Discuss the application of EPN Guidelines in the hospital set-up

Contents

1. Introduction to EPN Guidelines for effective and efficient pharmaceutical services
2. Products and technologies
3. Service delivery
4. Financing and pricing
5. Information management and sharing
6. Human resources
7. Governance
8. Compliance and compliance measurement
9. Application of the guidelines in hospital settings

7.4. Unit 28: EPN Standards of hospital pharmacy practice (8 hrs)

Objective

At the end of this unit, the candidate should be able to:

- Describe the EPN Standards of hospital pharmacy practice
- Apply relevant standards in his/her daily pharmacy practice activities

Contents

1. Introduction the EPN Standards of hospital pharmacy practice
    - Definition of standards
    - Hospital pharmacy duties

- Areas of hospital pharmacy

2. Premises, facilities and equipment (including work place safety)
3. Pharmacy practice
4. Governance and management

7.5. Unit 29: Standard operating procedures (12hrs)

Objectives

At the end of this unit, the candidate should be able to:

- Define standard operating procedures (SOPs)
- Explain the importance of SOPs
- Discuss the role of SOPs in the control of processes and procedures in pharmacy
- Discuss key steps for developing SOPs
- Discuss use of SOPs in training of staff
- Describe how to effectively and actively use SOPs
- Describe how to monitor compliance

Contents

1. Definition and understanding about SOPs
2. Importance of SOPs
3. Roles of SOPs in the control of processes and procedures in pharmacy
4. Developing SOPs for various processes carried out in the pharmacy
5. Making effective and active use of SOPs
    - Successful implementation
    - Overcoming resistance
    - Use of SOPs for training staff
    - Compliance to SOPs

7.6. Unit 30: Ward pharmacy services (4 hrs)

Objectives

At the end of this unit, the candidate should be able to:

- Discuss pharmacy ward services
- Describe the supply of medicine to hospital wards
- Identify the distribution systems in the hospital
- Describe the process of direct dispensing to in-patients
- Describe how to supply controlled medicines to the wards
- Describe how to manage ward stocks of various categories of medicines
- Describe how to monitor ward stocks
- Discuss how to handle ward stock returns to the pharmacy

Contents

1. Introduction to pharmacy ward services
2. Supply of medicines to hospital wards
    - Top up system
    - Requisition/medicine basket
    - Bulk ward stock system
    - Return of unused medicines
3. Supply and storage of controlled medicines
4. Direct dispensing to in-patients
    - Individual medicine order system

- Unit dose system
- Repackaging of medicines

5. Managing and monitoring ward stock medicines
   - Storage of ward stock
   - Emergency medicines kit
   - After hours supply
   - Monitoring ward stocks

7.7. Unit 31: Records management and pharmacy information systems (12 hrs)

Objectives

At the end of this unit, the candidates should be able to:

- Discuss the importance of records management in the pharmacy
- Discuss the importance of the pharmacy information system
- Describe the management of pharmacy records and documentation
- Discuss pharmacy information systems in the hospital

Contents

1. Introduction to pharmacy records management and information systems
2. Records management
   - Record-keeping documents
   - Report preparation
3. Pharmacy Information system
   - Data and information – Understanding the distinction between data and information
   - Data quality, processing and presentation
   - Information needs
   - Steps to develop a health management information system

7.8. Unit 32: Legal and regulatory framework for pharmacy practice (8 hrs)

Objective

At the end of this unit, the candidate should be able to:

- Describe pharmacy legal and regulatory systems
- Understand the key legal and regulatory issues related to hospital pharmacy practice and medicine use
- Understand the legislation and regulation governing medicine use
- Discuss the bodies responsible for the regulation of pharmaceuticals and pharmacy practice in the country
- Describe the legislation and regulation around narcotics and controlled medicines
- Describe the legislation and regulation for dispensing of medicines of various categories

Contents

1. Introduction to pharmacy legal and regulatory systems
   - National medicines policy
   - Medicines regulatory authority
2. National laws and regulations governing hospital pharmacy practice
3. National laws and regulations governing medicine use
4. Bodies responsible for the control and regulation of pharmaceutical services and their basic roles

5. Legal requirements for storage, distribution and use of controlled and psychotropic products
6. Legal requirement for dispensing of medicines of various categories
    - Over the counter medicines
    - Prescription only medicines
    - Pharmacy medicines
    - Reclassification of medicines

7.9. Unit 33: Ethical aspects of pharmacy practice (4 hrs)

Objective

At the end of this unit, the candidate should be able to:

- Describe ethical problems in the pharmacy
- Solve ethical problems
- Understand dispenser – patient relationship
- Understand the relationship of pharmacy staff with other professionals
- Understand the relationship of pharmacy staff with medical representatives

Content

1. Pharmacy ethical practice and behaviour
    - Principles of ethics
    - Pharmacy code of ethics
    - Principles of ethical conduct
2. Relationship of pharmacy staff with patients, health professionals and medical representatives
3. Cases studies on ethics

8. APPENDIX I: GLOSSARY AND ABBREVIATIONS

Adherence	Also called compliance. The extent to which a patient follows the prescribed treatment either medicinal or non-medicinal.
ADR – Card	A card provided by regulatory authority to health facilities for reporting adverse drug reactions observed or reported by patients.
Adverse Drug Reaction (ADR)	A sensitivity reaction that happens due to taking or even getting into contact with a particular medicine. The reaction may be mild or severe and even life threatening.
AIDS	Acquired Immune Deficiency Syndrome
Allergy	A very sensitive reaction to a substance that is normally harmless for most people. Exposure to certain substances (medicines, cosmetics, dust, animal fur, food items or various industrial or environmental chemicals) through swallowing, inhalation or touching can cause some people to have an allergic reaction. The allergic reaction can involve symptoms that affect the eyes, nose, respiratory tract and skin including; swelling, rash, and difficulty in breathing. In severe cases it can be life-threatening. See also Anaphylaxis.
Analgesic medicine	A medicine that relieves pain such as paracetamol, opioid analgesics (like morphine and codeine) or non-steroidal anti-inflammatory medicines (NSAIDs) like aspirin and ibuprofen.
Anaphylaxis	A rapid and very severe allergic reaction. Symptoms can include widespread rash, wheezing (difficulty breathing) and a shock-like state (anaphylactic shock) with low blood pressure. It can lead to death unless the patient is treated quickly with adrenaline injection and resuscitated. Penicillin is known to cause anaphylaxis in some patients.
Antibacterial Medicine	A medicine that kills or prevents the growth of bacteria.
Antihelminthic Medicine	A medicine that kills worms in the body and helps the body to pass them out in the faeces.
Antihistamine	A medicine that stops the action of histamine, a naturally occurring chemical released by the body, which is responsible for allergic symptoms such as sneezing, itching or hay fever.
Antihypertensive Medicine	A medicine that lowers blood pressure and is used to prevent or treat hypertension (high blood pressure).
Anti-inflammatory Medicine	A medicine that reduces inflammation, or swelling and pain. A group of these medicines is called non-steroidal anti-inflammatory drugs (medicines) (NSAIDs), e.g. aspirin, ibuprofen.
Antiretroviral (ARV) Medicine	A medicine active against retroviruses, particularly the human immunodeficiency virus (HIV). ARV medicines stop the reproduction of the HIV but do not kill the virus.
BCG	Bacillus Calmette-Guerin
Candidate	In this document it refers to person taking this course.
Compounding	Refers to extemporaneous preparation of a product through mixing one active ingredient or several with other pharmaceutical materials, as given in a standard formula or as instructed in a prescription or medical order.
Contraindication	A contraindication is a specific situation, for example allergy, high blood pressure, pregnancy, in which a medicine or procedure should NOT be used, because it may be harmful, dangerous or cause unwanted effects in the patient. For example penicillin should not be given to someone with a penicillin allergy; medicine that can harm an unborn baby should not be given to a pregnant woman.
Dependence	A state that develops with long-term or repeated use of certain medicines, resulting in the body's need to continue using the medicine in order to avoid uncomfortable, distressing or dangerous 'withdrawal symptoms'.
Disease	An abnormal condition of the body or mind that causes discomfort or dysfunction.
Dispensing	Preparing and giving out medicines to patients, according to a prescription or

	written order, along with appropriate counselling to ensure correct and safe use of the medicine.
Dosage forms	The physical form of a dose of medication, for example capsule, mixture, eye drops or injection.
Dose or dosage and course	The quantity of medicine to be taken, when it is to be taken and how long it is to be taken. For example 500mg of amoxicillin taken eight hourly per day for 5 days. 500 mg is the dose and eight hourly the dosage and 5 days is the course of treatment.
DPT	Diphtheria, Pertussis, Tetanus
EPI	Expanded Programme on Immunization
Essential medicines	Medicines chosen by a group of experts that meets the health care needs of the majority of a population whilst taking into account the cost.
Essential medicines list (EML)	A list of medicines chosen by a group of experts that meets the health care needs of the majority of a population whilst taking into account the cost. The WHO produces a model EML as a guide for countries or regions within a country to develop their own lists.
Expiry date	The date after which the product is no longer guaranteed to be safe to use. The manufacturer guarantees that the product will retain at least 90% of its original strength until the expiry date, provided storage instructions have been followed.
FBO	Faith-Based Organization
FEFO	First expiry, first out
FP	Family planning
Health system	Comprehensive health system that includes primary and other health care levels.
HIV	Human Immunodeficiency Virus
Hypertension	High blood pressure.
INN	International Non proprietary Name
Interaction	When more than one medicine is taken by a patient and together they cause an unwanted effect which does not occur when each medicine is taken alone. Interaction can also occur with food or alcohol.
Inventory	A detailed list of the quantities of items in stock. The term may also refer to the process of making an itemised list of products or supplies on hand.
Inventory management	Proper management of supplies, for example medicines, to make sure there are always enough medicines available in good condition. It is an essential activity for any medical store.
MCH	Maternal and Child Health
Monograph	A written, comprehensive description of a medicine included in a text book or product information leaflet. Details of uses, doses, interactions, side effects, contraindications, precautions and dosage forms for the medicine are included.
National Medicines Policy (NMP)	A written document that outlines government commitment to a goal or a guide for action to achieve access to quality medicines in order to meet the health care needs of the country's population at an affordable cost.
OPD	Outpatient Department
ORS	Oral Rehydration Salts
Prescription	A written order for treatment by a medical health professional.
Primary health care (PHC)	A practical approach to making essential health care universally accessible to individuals and community in an acceptable and affordable way and with their full participation.
Rational use of Medicines	The correct medicine that meets the needs of the individual patient is given or used, in the required doses for the appropriate length of time, at a cost that is affordable for the patient and the community.

Resistance	The natural ability of an organism (bacteria, virus, parasite) to alter itself so that medicines that used to work against it are no longer effective. For example bacteria and viruses can quickly develop resistance to medicines such as antibiotics and antiretrovirals and that is why it is very important to use these medicines according to strict guidelines.
Revolving Drug Fund (RDF)	Refers to the situation where fees are charged on drugs dispensed to patients with the aim of partially or fully recovering the cost of medicines to further finance medicines procurement or health services.
Route of administration	Refers to how medicine is given, taken or used, for example by mouth, intravenous (IV) injection or rectally.
Side effect	An effect caused by a medicine that is not desirable. Side effects can be minor or serious.
Standard Treatment Guidelines (STG)	Detailed guidelines on how common health problems in a country or region should be treated using both medicinal and non-medicinal treatments. STGs are usually developed by recognised experts from a range of disciplines.
STD	Sexually Transmitted Disease
Stock card	A record kept on a card in a store to monitor stock. Receipts and issuing of supplies (medicines or medical supplies) are recorded together with details of source or destination and quantity on hand is updated.
Stores ledger	A book where the movement of products in and out of a warehouse or storeroom is recorded in the same way as on a stock card.
Therapeutic	Therapeutic comes from the word therapy, which means treatment resulting in healing or controlling of a disease or disability.
Therapeutic Category	Groups of medicines that have a similar action on the body. For example antibiotics are medicines that treat bacterial infections; analgesic medicines relieve pain, cardiovascular medicines are used to treat heart, high blood pressure and circulation problems.
TT	Tetanus Toxoid
VEN	Vital, Essential, Non-essential
WFI	Water For Injection

9. APPENDIX II: LIST OF REFERENCES USED IN DEVELOPING THE SYLLABUS

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