PHARMACOLOGY SYLLABUS

FOR ASSOCIATE NURSING PROGRAM

SENIOR 4, 5 and 6

KIGALI, 2022

FOREWORD

Rwanda Basic Education Board (REB) is honored to avail the Pharmacology Syllabus as one of the subjects of Biology, Chemistry, and Nursing (BCN)combination. This document serves as official guide to teaching and learning of Pharmacology subject in BCN combination. The document ensures consistency and coherence in the delivery of quality education for the associate nurse that Rwanda wants.

Rwanda Basic Education Board (REB) has undertaken the task to introduce a combination of Biology, Chemistry, and Nursing (BCN) in the second cycle of secondary education level. The underlying principles behind the addition of this combination is to ensure that curriculum is responding to the needs of the learners, society, and the labor market.

Pharmacology subject one of subjects of competency-based curriculum that emphasizes on equipping the learners with required knowledge, skills, and attitudes to produce well-trained learners for quality nursing care improvement. High Quality Health Care is an important component of Health and Well-being of the Rwanda Vision 2050 "The Rwanda We Want" that aims to transform the country's socioeconomic status. It is only healthy people who can significantly play a major role in this socioeconomic transformation journey. Pharmacology subject equip the learner with necessary knowledge and skills that are required to safely administer medicines and monitor their effects on clients for all ages.

I wish to sincerely appreciate all the people who contributed to the development of this syllabus towards its accomplishment, particularly the leadership of the Human Resources for Health Secretariat (HRH) of the Ministry of Health (MoH) who organized the whole process from its inception. Any comment or contribution would be welcome for the improvement of this syllabus for the next edition.

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Director General, REB.

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I wish to sincerely express my appreciation to the people who contributed to the development of this syllabus until it was complemented. These are the Rwanda Basic Education Board (REB) staff, University of Rwanda (UR), College of Medicine and Health Sciences, Kibogora Polytechnic (KP), King Faisal Hospital, Kigali University Teaching Hospital (CHUK), Shyira District Hospital, the National Council of Nurses and Midwives (NCNM), the Rwanda Nurses and Midwives Union (RNMU), and secondary schools who availed their staff at various stages of the development of this syllabus.

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TABLE OF CONTENTS

1. GENERAL INTRODUCTION

1.1. Background on introduction of Biology, Chemistry, Nursing (BCN) combination in secondary schools

Since a long time ago, nursing education around the World has taken different steps from the traditional apprenticeship, vocational, and hospital-based training model to a higher education academic model of teaching and learning (Gaberson&Oemann, 2010). This paradigm shift was driven by the increased demand of the professionalization of nursing, the changing illness patterns, and the expansion of the knowledge-based society requiring more improved and innovative education preparation of nursing professionals that is adapted to the context and specific health needs (Yam, 2004).

In Rwanda, the above-mentioned transformations in nursing education evolved overtime. Healthcare education in general started in 1933 with medical assistants "Assistant Médicaux" program, followed by the assistant midwives "Auxiliaires accoucheuses" in 1949 (Harelimana, et., 2015). From 1954 up to 1979, the A2 and A3 programs were established at secondary level. From the academic year 1979 to 2004, the program of nursing education was exclusively "A2" secondary level (Kabgayi School of Nursing and Midwifery, 2013). Nurses were mostly prepared for hospitals and health center-based health care provision, leaving out the community. This gap was later addressed by introduction of the Community Health Workers (CHWs) in 1995 (MoH, 2012).

The Cabinet resolution of October 27th, 2004 phased out the A2 nursing program. A transition period was decided upon to move from nursing program A2 to Nursing Program A1 up to 2007. This was in the purpose to train nursing professionals at a tertiary level in order to produce highly-qualified professionals, thus improving the quality health care delivery. However, gaps in providing basic nursing care at different levels were continually observed.

Fourteen years later after the closure of Secondary school level for nursing education program, the Government of Rwanda has decided to introduce in second cycle of secondary education level, an option with combination of Biology, Chemistry and Nursing (BCN), as provided by the Article 58 of the Rwandan Law Determining Organisation of Education No 10/2021 of 16/02/2021 (MoE, 2021).

Therefore, the associate nurse program is being introduced to provide the support needed in basic nursing care provision, with capacity to progress in different advanced health care professions. This decision aims to meet the current and contextual health needs that present high demand to provide the basic nursing care at different levels of the Rwanda healthcare system, particularly in the community.

1.2. Associate nurse leaver's profile

Upon completion of the associate nursing program, learner should have acquired knowledge, skills and attitudes to:

1. Provide support to individuals, families, groups, and communities when faced with unwelcome news and life changing diagnoses;
2. Provide health education within her/his scope of practice;
3. Demonstrate understanding of the determinants of health that affect individuals, families, groups, and communities;
4. Demonstrate understanding of basic common health conditions affecting individuals of all age groups and their basic nursing care;
5. Assess individuals, families, groups and community health needs and provide basic nursing care using evidence-based practice;
6. Collaborate effectively with multidisciplinary team members, clients and stakeholders in provision of basic nursing care;
7. Demonstrate responsibility and accountability in daily activities;
8. Ensure the privacy, dignity and safety of individuals is maintained at all times;
9. Provide support for woman during pregnancy, normal delivery and post-natal care;
10. Explain scientific phenomena using correct scientific terminologies;
11. Demonstrate knowledge and skills required to progress to higher learning education;

12. Express themselves fluently, and with confidence, in speaking and writing using correct vocabulary and grammar appropriately;
13. Perform experiments using a range of scientific and medical tools and equipment and draw appropriate conclusions;
14. Demonstrate ability to manage data (collect, recording, processing, analysis, synthesis, and reporting).

1.3. Subjects of associate nursing programs

The subjects to be studied at each level are set out below:

1. Fundamentals of Nursing
2. Biology
3. Chemistry
4. Mathematics
5. Physics
6. Ethics and professional code of conduct
7. Medical Pathologies & infectious diseases
8. Surgical Pathologies
9. Pharmacology
10. Maternal and Child health
11. Individual learning
12. Clinical attachment
13. Kinyarwanda
14. English
15. French
16. Entrepreneurship
17. Citizenship
18. ICT
19. Sports/ Clubs

In order to achieve a competent level, the following subjects' syllabi are based on the following major components:

- The rationale or relevance of the subject
- Broad subject competencies
- Pedagogical and assessment approaches
- Specific objectives of the subject
- Learning outcomes per unit of learning
- Subject content
- Learning activities
- Learning material required
- Cross-cutting issues.

2. TEACHING AND LEARNING PHARMACOLOGY

2.1. Rationale of teaching and learning Pharmacology

Pharmacology subject is one of professional subjects specific to the Associate Nursing Program offered together with other science subjects of the BCN combination. The pharmacology subject is competence-based like other subjects of the second cycle of secondary education level in Rwanda.

Pharmacology subject provides the learner with the necessary knowledge and skills to safely administer medicines and monitor their effects on clients for all ages. The learner will also acquire knowledge and skills in drug dosage determination, and observation of desired and adverse effects of medicines. The subject provides knowledge and skills to timely refer the patient with side effects of essential medication for a better management of the patient.

2.1.1. Pharmacology and Society

Teaching pharmacology is critical for associate nurses to develop competences for effective use of essentials medication in primary healthcare. Pharmacology equips the healthcare professional with ability to correctly use medications to prevent and treat diseases. Furthermore, teaching associate nurse a pharmacology subject facilitates access and safe utilization of medications used for common conditions at primary healthcare levels. Additionally, a pharmacology subject complements with other health subjects to develop a competent healthcare professional who provides holistic care to population at all levels of healthcare system. Most importantly teaching pharmacology motivates the decentralization of quality healthcare provision at the near home level of community.

Above all, the rationale of teaching and learning of pharmacology is embedded in the fact that population needs medications appropriate to their clinical condition nearby their home all the time

2.1.2. Pharmacology and learner'

Associate nurses have to be prepared for responding to the health needs of the country. With this regard, pharmacology strives to equip learners with knowledge, attitude and skills necessary to professionally utilize essential medications to manage health conditions that pose burden to the healthcare system in Rwanda. At the center of teaching and learning of pharmacology, real clinical case studies will play a key role, which in turn, should contribute significantly towards developing learners' clinical reasoning, decision making with confidence in provision of quality healthcare, and meet the market needs.

2.2. Competences

Competence is defined as the ability to use an appropriate combination of knowledge, skills attitudes, values and behavior to accomplish a particular task successfully.

Basic competences are addressed in the stated broad subject competences and in objectives highlighted year on year basis and in each of units of learning. The generic competencies, basic competences that must be emphasized and reflected in the learning process are briefly described below and teachers will ensure that learners are exposed to tasks that help the learners acquire the skills.

2.2.1. Generic competences

Critical and problem-solving skills: The acquisition of such skills will help learners to think critically, innovatively and broadly to evaluate and find solutions to problems encountered in the healthcare system.

Creativity and innovation: The acquisition of such skills will help learners to take initiatives and use clinical reasoning beyond knowledge provided in classroom to generate new ideas and construct new solutions.

Research: This will help learners to find answers to questions based on existing information and concepts and use it explain phenomena from gathered information.

Communication in official languages: Teachers, irrespective of being language teachers will ensure the proper use of the language of instruction by learners. The teachers should use therapeutic communication in classroom to cultivate the health professional behaviors and communication skills in learners.

Cooperation, inter personal management and life skills: This will help the learners to cooperate as a team in whatever task assigned and to practice positive ethical moral values and while respecting rights, feelings and views of others. Perform practical activities related to environmental health conservation and protection. Advocate for personal, family and community health, hygiene and nutrition and responding creatively to a variety of challenges encountered in life.

Lifelong learning: The acquisition of such skills will help learners to update knowledge and skills with minimum external support. The learners will be able to cope with evolution of knowledge advances for personal fulfillment in areas that are relevant to their improvement and development

2.2.2. Broad pharmacology competences

The teaching of pharmacology should aim to:

- Demonstrate understanding of proper use of medications in provision of healthcare
- Utilize appropriately the essentials medications

- Monitor comprehensively the therapeutic effects and manage the side effects of essential medications
- Provide patients with complete information for medication use
- Encourage and respect the contribution of the patient in drug therapy.

The overall objective of learning pharmacology at upper secondary level is to promote safe use of medications at primary healthcare levels in order to improve health of population.

Upon completion of secondary education, learners will have acquired competences (knowledge, skills and attitudes) which will enable them to:

- Demonstrate an understanding of the essential drug classifications
- Apply pharmacology knowledge in healthcare provision
- Manage common health problems in community
- Demonstrate pertinent considerations when storing, reconstitution/dilution and administering medicines
- Apply ethical considerations in medication use
- Utilize safely the medications in managing health conditions.

2.2.3. Pharmacology and developing competencies

The national policy documents based on national aspirations identify some 'basic Competencies' alongside the 'Generic Competencies" that will develop higher order critical thinking skills and help students learn pharmacology for application in healthcare provision. The nature of learning activities which are mainly clinical reasoning oriented contributes to the achievement of those competencies.

Through case studies, clinical scenario, simulation, observation and presentation of information during the learning process, the learner will not only develop deductive and inductive skills but also acquire cooperation and communication, critical thinking and problem-solving skills. This will be realized when learners make presentations leading to inferences and conclusions at the end of

the learning unit. This will be achieved through learner group work and cooperative learning of pharmacology which in turn will promote interpersonal relations and teamwork. The learning activities that will be done in the classroom by learners will involve analytical and problem-solving skills directed towards innovation, creativity and research activities by learners.

The acquired knowledge in pharmacology should develop a professional healthcare provider confident in clinical case management independently. The teaching strategies should be applied with the necessary rigor, intellectual honesty to promote critical thinking while systematically pursuing the line of thought.

2.3. Pedagogical Approach

The constructivist approach of teaching will be at the heart of the implementation of pharmacology syllabus to facilitate the active participation of learners and develop clinical reasoning, and innovation in learning process.

2.3.1. Role of the learner

The approach considers the learning process to involve the construction of meaning by learners. Simply, it emphasizes the need for learners to think about scientific activity in order to make sense of and understand the scientific concepts being introduced. In the syllabus, learners are in the driver's seat which implies that they will construct their knowledge by posing question, critical observation and judgment, planning for patient visits and critical analyze the real clinical case studies, create and manage their own clinical case scenario, and critique current clinical case management.

More specifically, when engaging in inquiry, learners will describe clinical case studies, ask questions, construct explanations, compare those explanations with recommended clinical case management, and communicate their clinical summaries to others. By so doing, the learners will take ownership of the learning process. As for learners, their activities are indicated against each

learning unit reflecting their appropriate engagement in the learning process. Even though they do not necessarily take place simultaneously in each and every pharmacology lesson and for all levels, over time learners get involved in the following activities:

- Observing And, And Handling Medications
- Taking Part In Selecting Appropriate Clinical Case Studies For Learning Objectives
- Developing And Using Skills Of Gathering Data By History Taking And Physical Examination
- Working collaboratively with others, communicating their own ideas and considering others' ideas During Medication use.

Expressing themselves using appropriate professional terms and representations in writing and talk about Medication Context

- Engaging in lively public discussions in defense of their work and explanations;
- Applying their learning in real-life contexts While dealing with Medication

During this reciprocal interaction, what learners will acquire is not only content knowledge, but also a number of skills including how to approach a problem, identify important resources, design and carry out hands-on practices, analyze and interpret data, and take clinical decision

2.3.2. Role of the teacher

The role of the teacher will remain critical however. Instead of being the "sage on the stage", the teacher will rather be "the guide on the side" who acts as facilitator in a variety of ways which include:

- encouraging and accepting student autonomy and initiative
- demonstrate the clinical skills to the learners
- using medical terminology when formulate clinical case studies
- allowing student responses to drive lessons, shift instructional strategies, and alter content
- familiarizing themselves with students' understandings of concepts before sharing their own understandings of those concepts;
- encouraging students to engage in dialogue, both with the teacher and one another;

- encouraging student inquiry by posing thoughtful, open-ended questions and asking students to question each other;
- engaging students in experiences that pose contradictions to their initial hypotheses and then encouraging discussion;
- providing time for students to construct relationships and create metaphors; and nurturing students' natural curiosity.

2.3.3. Special needs education and inclusive approach

All Rwandans have the right to access education regardless of their different needs. The underpinnings of this provision would naturally hold that all citizens benefit from the same menu of educational programs. The possibility of this assumption is the focus of special needs education. The critical issue is that we have persons/ learners who are totally different in their ways of living and learning as opposed to the majority. The difference can either be emotional, physical, sensory and intellectual learning challenged traditionally known as mental retardation. Therefore, this program fits for healthy learners without sensory, emotional mental problems because the leavers of program will assist people living with different kinds of diseases and disability. To successfully learn this program requires being healthy with physical fitness to cope with existing learning, clinical materials and equipment as they necessitate cognitive, sensory and motor ability.

2.4. Assessment Approach

Assessment is the process of evaluating the teaching and learning processes through collecting and interpreting evidence of individual learner's progress in learning and to make a judgment about a learner's achievements measured against defined standards. Assessment is an integral part of the teaching learning processes. In the competence-based curriculum assessment must also be competence-based; whereby a learner is given a complex situation related to his/her everyday life and asked to try to overcome the situation by applying what he/she learned. Assessment will be organized at the following levels: School-based assessment, National assessment and National examinations.

2.4.1. Types of assessment

a) Formative and continuous assessment (assessment for learning)

Continuous assessment involves formal and informal methods used by schools to check whether learning is taking place. When a teacher is planning his/her lesson, he/she should establish criteria for performance and behavior changes at the beginning of a unit. Then at the of end of every unit, the teacher should ensure that all the learners have mastered the stated key unit competencies basing on the criteria stated, before going to the next unit. The teacher will assess how well each learner masters both the subject and the generic competencies described in the syllabus and from this, the teacher will gain a picture of the all-round progress of the learner. The teacher will use one or a combination of the following: (a) observation using a checklist (b) one minute paper (c) class presentation (d)quiz (e) case study.

b) Summative assessment (assessment of learning)

When assessment is used to record a judgment of a competence or performance of the learner, it serves a summative purpose. Summative assessment gives a picture of a learner's competence or progress at any specific moment. The main purpose of summative assessment is to evaluate whether learning objectives have been achieved and to use the results for the ranking or grading of learners, for deciding on progression, for selection into the next level of education and for certification. This assessment should have an integrative aspect whereby a student must be able to show mastery of all competencies. It can be an internal school-based assessment or external assessment in the form of national examinations. School based summative assessment should take place once at the end of each term and once at the end of the year. External summative assessment will be done at the end of Senior 6.

2.4.2. Record Keeping

This is gathering facts and evidence from assessment instruments and using them to judge the student's performance by assigning an indicator against the set criteria or standard. Whatever assessment procedures used shall generate data in the form of scores which will be carefully recorded and stored in a portfolio because they will contribute for remedial actions, for alternative instructional strategy and feed back to the learner and to the Teachers to check the learning progress and to advice accordingly or to the final assessment of the students. This portfolio is a folder (or binder or even a digital collection) containing the student's work as well as the student's evaluation

of the strengths and weaknesses of the work. Portfolios reflect not only work produced (such as papers and assignments), but also it is a record of the activities undertaken over time as part of student learning. Besides, it will serve as a verification tool for each learner that he/she attended the whole learning before he/she undergoes the summative assessment for the subject.

2.4.3. Item writing in summative assessment

Before developing a question paper, a plan or specification of what is to be tested or examined must be elaborated to show the units or topics to be tested on, the number of questions in each level of Bloom's taxonomy and the marks allocation for each question. In a Competence based curriculum, questions from higher levels of Bloom's taxonomy should be given more weight than those from knowledge and comprehension level.

Before developing a question paper, the item writer must ensure that the test or examination questions are tailored towards Competence based assessment by doing the following:

- Identify topic areas to be tested on from the subject syllabus.
- Outline subject-matter content to be considered as the basis for the test.
- Identify learning outcomes to be measured by the test.
- Prepare a table of specifications.
- Ensure that the verbs used in the formulation of questions do not require memorization or recall answers only but testing broad competencies as stated in the syllabus.

2.4.4. Structure and format of the examination

There will be 2 papers in pharmacology subject to be examined. Time allocated for all papers will depend on their respective weight. The papers will be structured as follows:

Component Weighting

COMPONENT	WEIGHTING
Paper 1 which measures knowledge and understanding (lower order thinking level) structured short answer questions.	Structured short answer questions will have 40% of the final marking of the assessment
Paper 2 which measures skills and advanced level of understanding (higher order thinking level) Unstructured answer questions or extended essay questions.	Unstructured answer questions will have 60 % of the final marking of the assessment

2.5. Reporting to parents

The wider range of learning, it is necessary to think about how to share the progress with students . A single mark is not sufficient to convey the different expectations of learning which are in the learning objectives. The most helpful reporting is to share with students what they are doing well and where they need to improve.

2.6. Resources

2.6.1. Material resources

For successful implementation of this syllabus the material resource is required. Thus, the following minimum requirement should be met:

- The school infrastructures with its surrounding;
- Textbooks and other written materials (syllabus, charts, books, newspapers, shapes, etc…);
- Skills lab for health and different pharmacological products;
- Improved teaching aids; and
- ICT equipment including the internet network.

2.6.2. Human resource

The effective implementation of this syllabus needs a joint collaboration of educators at all levels. Given the material requirements, teachers are expected to accomplish their noble role as stated above. However, teachers should be equipped with a strong pedagogical content knowledge (PCK) and enough teaching experience. Furthermore, pharmacology teacher should be creative and able to improvise since many of teaching aids can be found around the school and in clinical settings.

directors of studies should be trained on the use of competence-based syllabus then, he will be able to make a follow-up and assess the teaching and learning of this subject with based health profiles. These combined efforts will ensure bright future careers and lives for learners as well as the contemporary development of the country.

Skills and attitude required for the teacher of Pharmacology:

- Engage students in variety of learning activities;
- Apply appropriate teaching and assessment methods;
- Adjust instructions to the level of the learner;
- Creativity and innovation, makes connections/relations with other subjects;
- Show a high level of knowledge of the content;
- Develop effective discipline skills manage adequately the classroom;
- Good communicator, Guide and counselor; and
- Passion for student teaching and learning.

3.SYLLABUS UNITS' DEVELOPMENT

3.1. Presentation of the Structure of the syllabus units

Pharmacology is taught and learned in upper nursing secondary school education as a core subject.

At every grade, the syllabus is structured in Topic Areas, and then further broken down into Units. The units have the following elements:

1. Unit is aligned with the Number of Lessons.
2. Each Unit has a Key Unit Competence whose achievement is pursued by all teaching and learning activities undertaken by both the teacher and the learners.
3. Each Unit Key Competence is broken into three types of Learning Objectives as follows:
   a) Type I: Learning Objectives relating to Knowledge and Understanding (Type I Learning Objectives are also known as Lower Order Thinking Skills or LOTS)
   b) Type II and Type III: These Learning Objectives relate to acquisition of skills, Attitudes and Values (Type II and Type III Learning Objectives are also known as Higher Order Thinking Skills or HOTS).
4. Each Unit has a Content which indicates the scope of coverage of what a teacher should teach and learner should line in line with stated learning objectives
5. Each Unit suggests Learning Activities that are expected to engage learners in an interactive learning process as much as possible (learner-centered and participatory approach).
6. Finally, each Unit is linked to Other Subjects, its Assessment Criteria and the Materials (or Resources) that are expected to be used in teaching and learning process.

In all, the syllabus of Pharmacology for upper nursing secondary level has got 11 unities including 3 units in S4, 5 units in S5 and 3 units in S6.

3.2. Pharmacology for S4

3.2.1. Key Competences at the end of S4

At the end of S4 would be achieved the main competences follow:

- Apply fundamental principles of pharmacology in patient care
- Apply concepts of drug and body interaction in clinical management
- Monitor comprehensively drug effects during clinical management
- Administer safely medications to the patients.

3.2.2. Table units for S4

Topic Area: Pharmacology			Subtopic: General Pharmacology	
S4 pharmacology	Unit 1: Principles of Pharmacology			No. of periods: 36
Key Unit Competence: Learner will be able to explain fundamental principles of pharmacology during patient care				
Learning Objectives			Content	Learning activities
Knowledge and understanding	Skills	Attitudes and values		
Define the term "pharmacology and drug" Identify the categories ofdrug names Describe drug dosage forms Explain the drug therapyeffects	Distinguish Chemical, Generic, and Trade Namesfor drugs Differentiate therapeutic, toxic effects, and adverse drug reactions	Demonstrate understanding of concepts and principles of pharmacology from nursing perspectives Recognize the food and Drug Administration (FDA)pregnancy risk categories during drug therapy for pregnant women	Drug dosage form, Drug therapy effects: therapeutic effects, adversedrug reactions, sides effect,toxic effect, allergic reaction (hypersensitivity) Doses and drug regimen,loading doses and maintenance doses, Fixed dose combination, Directly observed Therapy,	Learner differentiate drug forms, drug dosage and drug names after presentation of case studies and groups discussion Reviewing different Books of Pharmacology; learner discuss the importance of label in drug administration and storage

Introduce the roles and responsibilitiesof nurses in anti-infective drug therapy Explain the term antidotes in drug therapy Describe thedrug dosageforms Explain fixed dose combinationand Directly observed therapy	Distinguish doses and drug regimen Differentiate loading and maintenancedoses Utilize appropriate pharmacology terminology during clinical practice Interpret thedrug label container before medication use.	Appreciate the importance of directly observed therapy and fixed dose combination inpatient care	Responsibilities of nurses regarding safe drug administration	Searching in library learner identify FDA pregnancy riskcategory Using a case study,learner Discuss the importance of Loading Doses and Maintenance Doses in patient care
Links to other subjects: Human biology, medical nursing, and surgical nursing				
Assessment criteria: learner appropriately explains the fundamental principles of pharmacology and identity its applications during drug therapy				
Materials: Pharmacology book, internet connectivity, drugs (tablets, capsule, ampules, vials), needles, syringes, water for injection, and IV giving set				

Topic Area: Pharmacology			Subtopic: General Pharmacology	
S4 pharmacology	Unit 2: Pharmacokinetics and pharmacodynamics			No. of periods: 24
Key Unit Competence: To be able to explain the application of pharmacokinetics and pharmacodynamics during clinical practice				
Learning Objectives			Content	Learning activities
Knowledge andunderstanding	Skills	Attitudes and values		
Define the term pharmacokinetics and pharmacodynamics Discuss the drug –drug, drug-food/beverage interaction Identify the four primary processes of pharmacokinetics. Explain mechanisms by which drugs cross plasma membranes. Discuss factors affecting drug absorption. Discuss how drugs are distributed throughout the body.	Apply the pharmacokinetic principles in clinical decision making Apply frequency distribution curves to explaininter patient variability in medication response. Compare and contrast median lethal dose (LD50) and median	Acknowledge the interaction of drugs during prescription Appreciate the importance of the median effective dose (ED50) to clinical practice. Acknowledge the significance of the dose–response relationship to clinical practice.	Introduction to Pharmacokinetics Primary Processes of Pharmacokinetics: Absorption Distribution Metabolism Excretion Factors influencing drug effects Drug –drug, drug-food/beverage interaction	Learner identify factors that affect absorption, distribution, metabolism and excretion across the lifespan after discussing case studies and readingthe book Learner Discuss the interaction between drugs and between drugs and food/ beverage by using case scenario of different medical prescriptions

• Describe how plasmaproteins affect drug distribution. • Explain the metabolism of drugs and its applications to pharmacotherapy. • Identify major processes by which drugs are excreted. • Explain how enter hepatic recirculation affects drug activity. • Explain how a drug reaches and maintains itstherapeutic range in the plasma. • Explain the applications of a drug's plasma half-life (t1/2) to pharmacotherapy. • Employ principles of pharmacodynamics to explain variations in drugresponse in a population. • Describe the relationship between receptors and drug action.	• toxicity dose (TD50). • Relate a drug's therapeutic index to its margin of safety. • Compare and contrast the terms potency and efficacy. • Distinguish between an agonist, partial agonist, and antagonist.	• Recognize the importance of pharmacokinetics andpharmacody-namics inclinical practice	• Time–Response Relationships • Drug PlasmaLevels • Drug Half-Life • Introduction to pharmacodynamics • Interpatient Variability • Therapeutic Index • Dose–Response Relationship • Potency and Efficacy • Receptor Theory • Agonists and Antagonists • Pharmacodynamics and pharmacokinetics inspecial population	• Learner in group discussion compare and contrast pharmacodynamics and pharmacokinetics in neonates, infant, and child, adult and elderly people Using pharmacology book

Links to other subjects: Human biology, Medical nursing, and surgical nursing				
Assessment criteria: Learner able to explain appropriately the fundamental principles of pharmacology and identity its applications in drug therapy				
Materials: pharmacology book, internet connectivity, clinical case studies				
Topic Area: Pharmacology			Subtopic: General Pharmacology	
S4 pharmacology	**Unit 3: Principles of drug administration**			**No. of periods: 24**
Key Unit Competence: Learner will be able to administer medications				
Learning Objectives			Content	Learning activities
Knowledge and understanding	Skills	Attitudes and values		
• Explain how the rights of drugadministration affect client safety. • Describe how the storage of drugs can affect their effectiveness. • Explain the importance of properly documenting medication administration. • Outline a plan for improving patient adherence to the medication regimen.	• Compare and contrast enteral,topical, and parenteral drug administration. • Compare and contrast the advantages and disadvantages of each route of drug administration. • Interpret drug orders that contain abbreviations.	• Relate the importance of dosing schedules tosuccessful pharmaco-therapeutic outcomes • Appreciate the importance of compliance to drug regimen in patient management	• The rightsof drug administration • Compliance/ adherence to drug regimen • Routes of drug administration: enteral, topical, and parenteral • Medicationerrors	• In group using a role play, learner discuss rights of drug administration • Using a case scenario, Learner discuss the factors affecting patient's compliance to the regimen • Using a book, learner Present on advantages and disadvantages of different routes of drug administration.

• Discuss the factors affecting patient compliance to the drug regimen • Provide patient complete instructions about the use of medication to promote adherence to the drug regimen • Explain the proper methods of administering enteral, topical, and parenteral drugs • Describe the impact of a medication error on all aspects of an institution, including patients, staff nurses, administrative personnel, and departments • Describe procedures for reporting and documenting medication errors and incidents. • List of strategies that the nurse can implement to reduce medication errors. • Explain how medication reconciliation can lead to a reduction in medication errors.	• Compare and contrast the three systems of measurement usedin pharmacology • Convert between different measuringsystems when givendrug orders • Calculate the correct dose of a drug for different drug dosage forms	• Safely administer drug in the appropriate routes • Respect rules, policies, and procedures to help in prevention ofmedication errors • Respect a well written medicalprescription during drug administration	• systems of measurement used in pharmacology Characteristicsof a well written medicalprescription • Calculation of drug dosage: tablets, syrup, vials, powder forms.	• Referring to the real medical orders, learnerinterprets medical prescriptions and calculates the dosage appropriately

• Identify the elements of a well written medical prescription • Differentiate reconstitution and dilution of medication				
Links to other subjects: Human biology, and fundamentals of nursing				
Assessment criteria: Learners are able to administer medications				
Materials: pharmacology book, internet connectivity, clinical case studies, drug dosage forms (tablets, capsule, ampules, vials), needles, syringes, water for injection, IV giving set, trolley, tray, spoon, cup, mannequin				

3.3. Pharmacology S5

3.3.1. Key Competences at the end of S5

- Utilize appropriately anti-infective medications to manage different health conditions at the primary healthcare settings
- Monitor therapeutic effects and adverse drug reaction of anti-infective
- Respect treatment guidelines to manage infectious diseases to include malaria, Sexually Transmitted Infections (STIs), and HIV/AIDS.

3.3.2. Table units for S5

Topic Area: Pharmacology			Subtopic: Applied Pharmacology	
S5 pharmacology	**Unit 1: Antibiotics**			**No. of periods: 24**
Key Unit Competence: Learner will be able to manage different health conditions at the primary healthcare settings by utilizing antibiotics appropriately.				
Learning Objectives			**Content**	**Learning activities**
Knowledge and understanding	**Skills**	**Attitudes and values**		
• Define antibiotics and key concepts related to antibiotictherapy • Identify propertiesof ideal antibiotics • Explain the mechanisms by which antibiotic drugs act to kill pathogens or restrict their growth.	• Utilize the Centers for Disease Control and Prevention (CDC) guidelinesfor preventing antimicrobial resistance in healthcare settings • Provide the clinical rationalefor selecting specific antibiotics.	• Acknowledge the correct use of antibiotics • Recognize the clinical significanceof bacterial resistance • Demonstrate understandingof the clinical importance ofselecting the correct antibiotic for the individual patient.	• Definition of antibiotics • Key concepts: bacteriostatic, bactericidal, narrow and broad spectrum, antibiotic resistance, superinfection, and Selective toxicity indications, pharmacokinetics, contraindications, most common adverse reactions of antibiotics assigned on scope of associate nurse • Ideal antibiotics • Mechanism of actions of antibiotics	• Using clinical case studies, learner discuss how poor use of antibiotics contribute to public health issues • Using role play, in group, learner discuss the strategies, the healthcare providers should use to prevent antibiotic resistance
			• Drug resistance	

• Identify the mechanism of antibiotic resistance • Classify theantibiotics • Describe therapeutic actions, indications,pharmaco-kinetics, contraindications, most common adverse reactions, and important drug– drug interactions associated with each of the classesof antibiotics. • Identify the antibiotic drugs from national/ treatment guidelines and essential drug list used at primary healthcare	• Compare and contrastantibiotic drugs availablein Rwandan primary healthcare • Utilize National treatment guidelines to managebacterial infectious diseases		• Prevention of antibiotic resistance • Classification of antibiotics – Sulfonamides – Penicilins – Cephalosporins – Macrolides – Fluoroquinolones – Aminoglycosides – Tetracyclines • Detailed description of antibiotics available at the Rwandan healthcare settings • Medications used in treatment of bacterial sexually transmitted diseases and tuberculosis	• Using national essential drug lists and searching in library: – Identify drugs in sulfonamides, penicillins, cephalosporins, macrolides, quinolones, aminoglycosides and tetracyclines available in skills lab. – Learner perform a comparison of class of antibiotics medications in skills laboratory

• Outline nursing considerations for patients receiving each class of anti-biotic.				
Links to other subjects: Human biology, fundamentals of nursing, medical pathology, and surgical pathology				
Assessment criteria: Learners able to manage appropriately different health conditions at the primary healthcare settings by utilizing antibiotics				
Materials: pharmacology book, internet connectivity, clinical case studies, antibiotic drugs, national essential drug list, national treatment guidelines				
Topic Area: Pharmacology			**Subtopic: Applied Pharmacology**	
S5 pharmacology	**Unit 2: anti-helminthic**			**No. of periods: 6**
Key Unit Competence: learner will be able to appropriately utilize anti-helminthic drugs to manage different health condition at the primary healthcare settings				
Learning Objectives			**Content**	**Learning activities**
Knowledge and understanding	**Skills**	**Attitudes and values**		
• Define anthelmintic drugs and mass de-worming	• Compare and contrast the anthelmintic • Discuss the im-portance of mass deworming in the community	• Appreciate importance of deworming acrossthe lifespan • Acknowledge the correct use of anthel-mintics	• Deworming and public health • anti-helminthic • Mechanism of ac-tions	• searching in li-braryon different pharmacological articles, discuss the importance of deworming in community

• Describe the therapeutic actions, indications, pharmacokinetics, contraindications, most common adverse reactions, and important drug–drug interactions associated with the anthelmintics. • Discuss the use of anthelmintics across the lifespan. • Outline the nursing considerations, including important teaching points to stress for patients receiving an anthelmintic.	• Utilize National treatment guidelines to manage commonworms	• Demonstrate understanding ofthe importance deworming in nutrition	• The therapeutic actions, indications, pharmacokinetics, contraindications, most common adverse • reactions, and important drug–drug interactions associated with the anthelmintics available atthe primary healthcare settings • the nursing considerationsof anthelmintics available at the primary healthcare settings • Medications used in treatment of anthelmintics available atthe primary healthcare settings	• Learner discuss anthelmintic drugs available at the Rwanda primary healthcare settings using Rwanda national essential drug list. • Learner performs appropriate selection of anthelmintic drugs, justify his/her choice and describe the • possible side effects and nursing management after discussion o case studies
Links to other subjects: Human biology, fundamentals of nursing, medical pathology, and surgical pathology				
Assessment criteria: learners appropriately utilize anthelmintic drugs in deworming of individuals, family and community				
Materials: pharmacology book, internet connectivity, clinical case studies, anthelmintic drugs, national essential drug list, national treatment guidelines				

Topic Area: Pharmacology			Subtopic: Applied Pharmacology	
S5 pharmacology	**Unit 3: antiprotozoal drugs**			**Nomber of periods: 18**
Key Unit Competence: Learner will be able to appropriately utilize antiprotozoal drugs to manage different health condition at the primary healthcare settings				
Learning Objectives			**Content**	**Learning activities**
Knowledge and understanding	**Skills**	**Attitudes and values**		
• Define antiprotozoal drugs • Identify the indications ofantiprotozoal • Classify the antiprotozoal • Explain the importance of Plasmodium's life cycle in pharmacotherapy of malaria. • Identify antiprotozoal medications from national essentialdrug list and treatment guidelines	• Apply the nursing considerations to care for patients receiving pharmaco-therapy for protozoa • Administer correctly the anti-malarial medications • Calculate correctly antimalarial drug dosage before drug administration • Utilize National treatment guidelines to manage malaria	• Value the correct use ofantiprotozoal med-ication use inorder to minimize the drug resistance • Provide patients with appropriatehealth educationto prevent drug resistance and limit diseases trans-mission • Respect the National treatmentguidelines to manage health conditions	• Definition of antiprotozoal medications • Classification of antiproto-zoal medications • Antimalarial medications • Plasmodium's life cycleand malaria treatment • Anti-malarial drug dosage calculation • Treatment of malaria • Non-malarial antiprotozoal medications • Health education about malaria and amebiasis treatment	• Learner performs appropriate selection of antimalarial medications, calculation of doses and discusses the interaction between medications and food/beverage after presentation of case studies and reading available malaria treatment guidelines

• Describe therapeutic actions,the mechanism(s) of drug action, indications, contra-indications, significant drug interactions, pregnancy category, and important adverse effects of antiprotozoal drugs found at the primaryhealthcare settings according to the national essential drug list.				• Learner list antiprotozoal drugs availableat the Rwanda primary healthcare settings; describe the management of amebiasis using national essential drug list, and treatment guidelinesavailable.
Links to other subjects: Human biology, fundamentals of nursing, medical pathology, and surgical pathology				
Assessment criteria: learners able to utilize appropriately antiprotozoal medications to manage common health conditions				
Materials: pharmacology book, internet connectivity, clinical case studies, anthelmintic drugs, national essential drug list, and national treatment guidelines				

Topic Area: Pharmacology			Subtopic: Applied Pharmacology	
S5 pharmacology	**Unit 4: Antifungal drugs**			**No. of periods: 8**
Key Unit Competence: To be able to utilize appropriately antifungal medications to manage different health condition at the primary healthcare settings				
Learning Objectives			**Content**	**Learning activities**
Knowledge andunder-standing	**Skills**	**Attitudes and values**		
• Define the antifungalmed-ications • Classify antifungalmedi-cations • Describe the Explain the mechanism(s) of drug ac-tion, primary indications, contraindications, signif-icant drug interactions, pregnancy category, and important adverse effects of medications available at the primary healthcare settings according to the National essential list of drugs	• Compare and contrast the pharmacothera-pyof superficial and systemic fungal infections. • Choose specific antifungal med-ications to be used for localand systemic infec-tions	• Respect the na-tional treatment guidelines toad-minister antifun-gal medication • Acknowledge the need of local or systemicantifun-gal medication in clinical case man-agement	• Define antifungal drugs • Classification ofantifungal drugs • Comparison between sys-temic and local antifungal medications • The mechanism of action, indications, pharma-cokinetics, contraindications, most common adverse reactions, and important drug–drug interactions associated with the anti-fungal drugs availableat the primary healthcaresettings	• using clinical case studies about local fungal infection, pharmacology book and National essential list of drugs – Learner identify the local and sys-temic antifungal drugs available at the primary healthcare settings

• Outline the nursing considerations for patientsreceiving a systemic or topical antifungal			• The nursing considerations of antifungal drugs available at the primary healthcare settings • Medications used in treatment of antifungal available at the primary healthcare settings	– Learner discuss therapeutic and adverse drug effects of antifungal drugs available at the primary healthcare settings; identifythe nursing considerations and – provide health education
Links to other subjects: Human biology, fundamentals of nursing, medical pathology, and surgical pathology				
Assessment criteria: learners manage effectively patients with fungal infections within the scope of practice of associatenurses				
Materials: pharmacology book, internet connectivity, clinical case studies, antifungal drugs, national essential drug list, national treatment guidelines				

Topic Area: Pharmacology			Subtopic: Applied Pharmacology	
S5 Pharmacology	**Unit 5: Antiviral drugs**			**No. of periods: 16**
Key Unit Competence: Learner will be able to appropriately utilize antiretroviral medications to limit HIV/AIDS transmission				
Learning Objectives			**Content**	**Learning activities**
Knowledge andunderstanding	**Skills**	**Attitudes and values**		
• Define antiviral drugs • Differentiate antiviral from antiretroviral drugs • Explain the mechanism of actionof antiviral drugs • Describe the primary steps in thepathogenesis of HIVinfection. • Explain reasons for treatment failure during HIV-AIDS pharmacotherapy.	• Manage the patients with HIV/AIDS • Apply National treatment guidelines for HIV/AIDS in clinical practice • Monitor the therapeutic effects and adverse reaction of anti-retroviralmedication	• Demonstrate behavior that Promotes the adherence of patients to theantiretroviral medications • Demonstrate the understanding of measures to prevent antiretroviral drugresistance • Demonstrate behavior to promote friendlyuse of HIV/AIDS services	• Define antiretroviraldrugs • Difference between antiretroviral and antiviraldrugs Classification of antiretroviral drugs • The mechanism of action, indications, pharmacokinetics, contraindications, most common adverse reactions, and important drug–drug interactions associated with the antiretroviral drugs lines for HIV/AIDS	• Using clinical case studies and National treatment guidelines about HIV/AIDS, search in library : – Learner classify the antiretroviral medications used in the national treatment of HIV/AIDS; – Identify the HIV/AIDS treatment lines – Identify the HIV/AIDS treatment lines ; – Discuss the reasons of changing antiretroviral regimen;

• Explain the purpose and expected outcomes of HIV-AIDS pharmacotherapy. • Describe the advantages of highly active antiretroviral therapy in the pharmacotherapy of HIV infection. • Compare and contrast the classes of antiretroviral medications. • Explain the protocol and rationale for post exposure prophylaxis following occupational exposure to HIV- infected fluids. • Describe the antiretroviral protocol used for reducing the risk of perinatal transmission and for			• Medications used in treatment of HIV/AIDS	– Explain the follow up of patients with HIV/ AIDS – Discuss the role of healthcare providers in prevention of antiretroviral drug resistance. – Learner identify the causes poor adherence; list the consequences of poor adherence; explain the causes of drug resistances; discuss the measures to improve drug adherences after watching a video about adherence and resistance to the antiretroviral drugs • Using case studies about HIV/AIDS exposure and National treatment guidelines of HIV/AIDS

• treating pediatricpa-tients with HIV-AIDS.				– Learner differentiate pre-exposure and post ex-posure prophylaxis; – Discuss the need of expo-sure prophylaxis; – Identify the protocol of ex-posure prophylaxis; – Explain the importance of exposure prophylaxis. – Discuss about prevention of motherto child trans-mission (PMTCT); – Outlines medicationsused in PMTCT; – Discuss the importanceof PMTCT.
Links to other subjects: Human biology, fundamentals of nursing, medical pathology, and surgical pathology				
Assessment criteria: learners utilize correctly the national treatment guidelines for HIV/AIDS in prevention of HIV/AIDS transmission and managing people living with HIV/AIDS				
Materials: pharmacology book, internet connectivity, clinical case studies, antiretroviral drugs, national essential drug list, nation-al treatment guidelines				

3.4. Pharmacology S6

3.4.1. Key Competences at the end of S6

- Choose an appropriate drug for managing fever, pain, inflammation, rhinitis and common cold.
- Appropriately administer local anesthesia before suturing a simple traumatic wound.
- Choose the appropriate drugs to treat common gastrointestinal conditions
- Acknowledge the importance of adherence to medications for hypertension, diabetes mellitus and asthma..

3.4.2. Table units for S6

<table>
<tr><td colspan="3">TOPIC AREA: Pharmacology</td><td colspan="2">Subtopic: Applied pharmacology</td></tr>
<tr><td>S6 pharmacology</td><td colspan="2">Unit 1: Medications for fever, pain and inflammation</td><td>No. of periods: 24</td></tr>
<tr><td colspan="5">Key Unit Competence: Learner will be able to provide appropriate medication for pain, fever, and inflammation</td></tr>
<tr><td colspan="3">Learning Objectives</td><td rowspan="2">Content</td><td rowspan="2">Learning activities</td></tr>
<tr><td>Knowledge and understanding</td><td>Skills</td><td>Attitudes and values</td></tr>
<tr><td>• Describe physiology of pain
• Describe physiology of fever</td><td>• Utilize different tools for pain assessment and scoring
• Diagnose Fever to the patient</td><td>• Consider patient's complaints in pain management</td><td>• Pain Physiology
• Different types of pain
• Myths about pain characteristics and mode of action of non-steroid anti-inflammatory medication</td><td>• Learner identify different types of pain and use a pain scales to score pain Using peer role play, anleand simulate patient in pain (use scenario of different types of pain)</td></tr>
</table>

• Explain the mechanism of seizures related to fever • Explain characteristics and mode of action of non- steroid anti- inflammatory medication • Describe the therapeutic and adverse effects of non- steroidal anti- inflammatory medication • Describe the management of seizures associated with high fever	• Choose an appropriate drug for managing fever, pain, inflammation • Manage appropriately acute and chronic pain • Provide patient with ant—seizure medication in appropriate route • Provide appropriate medications for rhinitis and common cold. • Appropriately administer local anesthesia before suturing a simple traumatic wound.	• Demonstrate the appropriate nursing attitude towards the patient with fever • Demonstrate the appropriate use of WHO pain ladder in management of pain • Appreciate the effective management of pain, fever and inflammation based on nationalguidelines. • Timely manage seizures related to fever • Manage effectively patients with rhinitis and common cold	• Pain assessment and scoring • Physiology of fever • Seizures related to fever • Non-Steroidal Anti- Inflammatory Drugs • WHO pain ladder • Medications used for chronic pain • National guidelines for pain and fever management • Drug for seizures • Drugs used to treat rhinitis and common cold • Local anesthesia	• Using case studies, in group,learner identify fever and related complications • Using the national essential drugs list; learner identify medications used to treat pain, fever, and inflammation • Using national essential of drugs list and pharmacology book, In group discussion learner compare and contrast different medications used to treat pain, fever, and inflammation available at primary healthcare; • Using Rwanda pain management guidelines,learner compare and contrast the management of acute and chronic pain

• Explain the categories of medications used to treat rhinitis and common cold • Identify medication used to treat common cold. • Identify types oflocal anesthesia • Explain the mechanism ofaction of localanesthesia • Identify possiblecomplications related to local anesthesia		• Demonstrate effective pain management during wound suturing using localanesthesia		• Using case studies aboutpatients with fever fromdifferent origins and pharmacology book, learner discuss effectivemanagement of fever and afebrile seizures. • Using pharmacology book, Present about medications used to treat seizures, and theirnursing considerations • Using case studies and pharmacology book, learner discussthe medications usedto treat rhinitis and common cold. • Using case studies, learner identify on types of local anesthesia used to effectively manage simple traumatic wounds
Links to other subjects: Human biology, fundamentals of nursing, medical pathology, and surgical pathology				

Assessment criteria:

- Learner appropriately administers non-steroidal anti-inflammatory drugs and explains therapeutic, adverse drug effectsand instruction of using non-steroidal anti-inflammatory drugs, and local anesthesia.
- Learner effectively manage fever of any origin

Materials: pharmacology book, internet connectivity, clinical case studies, non-steroidal anti-inflammatory drugs, local anesthesia, anti-seizure drugs, national essential drug list, national treatment guidelines, needles, syringes, water for injection, sterile gloves, proper gloves, sutures, drapes, forceps, trolley, tray, mannequin, disinfectant, and antiseptics

<table>
<tr><td colspan="3">Topic Area: Pharmacology</td><td colspan="2">Subtopic: Applied Pharmacology</td></tr>
<tr><td>S6 pharmacology</td><td colspan="2">Unit 2: Drugs acting on Gastrointestinal tract</td><td>No. of periods: 24</td></tr>
<tr><td colspan="5">Key Unit Competence: Learner will be able to provide appropriate medications for common gastrointestinal medical conditions management</td></tr>
<tr><td colspan="3">Learning Objectives</td><td rowspan="2">Content</td><td rowspan="2">Learning activities</td></tr>
<tr><td>Knowledge and understanding</td><td>Skills</td><td>Attitudes and values</td></tr>
<tr><td>• Identify the classification of drugs used to treat gastro enteral medical conditions
• Describe the mechanism of action of drugs for peptic ulcers, anti-emetics and laxative drugs</td><td>• Choose the appropriate drugs to treat common gastrointestinal conditions
• Provide appropriate health education about proper use to manage gastro enteral conditions</td><td>• Effectively manage constipation, gastritis, nausea and vomiting
• Appreciate the importance of timely management of diarrhea andvomiting</td><td>• Drugs for peptic ulcers, antiemetic, and laxatives.
• ORS and IV fluids
• Homemade rehydration solution solution
• Body fluid compartments and requirements
• Calculation of drop rate</td><td>• Using National list of essential drugs, In group discussion; learner
– identify the drugs for peptic ulcers, anti-emetics and laxatives; compare and contrast drugs used for peptic ulcers, anti-emetics, and laxatives for clinical use; describe nursing considerations and health education for peptic ulcers, anti- emetics, and laxatives for clinical use</td></tr>
</table>

• Discuss oral rehydration salts and intravenous fluid to manage fluids and electrolytes imbalances • Describe the elements of oral rehydration salts • Explain abdominal spasm • Identify drugs used to manage abdominal spasms.	• Calculate body fluid requirements • Calculate correctly drop rate before intravenous fluid administration • Administer appropriately the intravenousfluids • Prepare homemade solution to manage diarrhea • Monitor the therapeutic andside effects of antispasmodic medications	• Document correctly theadministeredfluids • Recognize the appropriate medications for abdominal spasm	• Anti-spasmodic medications	• Using different medical prescriptions; learner calculatedrop rate of prescribed fluids • Using pharmacology book, Discuss the effects of ORS and IV fluid on body fluid and electrolyte balance • Using salts, sugar and water, In group , prepare a homemade oral rehydration salt • Using case studies about abdominal pain, discuss the abdominal spasm and medicationsused to manage abdominal spasm • Using salts, sugar and water, In group , prepare a homemade oral rehydration salt • Using case studies about abdominal pain, discuss the abdominal spasm and medicationsused to manage abdominal spasm
Links to other subjects: Human biology, fundamentals of nursing, medical pathology, and surgical pathology				
Assessment criteria: learner administers appropriately drugs acting on Gastrointestinal and explains therapeutic, adverse drugeffects and instruction of using drugs acting on Gastrointestinal.				
Materials: pharmacology book, National and WHO treatment guidelines for gastrointestinal medical conditions management,National essential drug list, internet connectivity, drug affecting gastrointestinal tract, IV fluids (NS, RL,DW), needles, syringes, water for injection, proper gloves, trolley, tray, safety box, dustbin				

Topic Area: Pharmacology			Subtopic: Applied Pharmacology	
S6 pharmacology	**Unit 3: Medications used for non-communicable diseases**			**No. of periods: 24**
Key Unit Competence: Learner will be able to provide appropriate medications for hypertension, diabetes mellitus and asthma				
Learning Objectives			**Content**	**Learning activities**
Knowledge and understanding	**Skills**	**Attitudes and values**		
• Explain hypertension, diabetes mellitus and asthma • Explain how hypertensionis classified. • Classify the antihypertensive drugs • Describe general principles guiding the pharmacotherapy of hypertension. • Explain antidiabetic medications • Classify antidiabetic medications • Classify medications usedto manage asthma	• Compare and contrast the roles of no pharmacologic and pharmacologic methods in the management ofhypertension. • Utilize nationaltreatment guidelines for NCDs in clinicalmanagement	• Appreciate the medicalprescription for non-communicable diseases • Demonstrate understanding of importance of non-communicablediseases • Respect the national treatmentguidelines to manage patients at the primary healthcare settings	• Definition • Anti-Hypertension drug • Diabetes mellitus drug • Anti-Asthmatic drug • Classification of antihypertensive, anti-diabetes, anti-Asthmatic drugs. • Treatment for hypertension diabetesmellitus and asthma • Nursing consideration during hypertension, diabetes mellitus and asthma drug therapy.	• Using clinical case studies and national treatment guidelines Put the prescribed medications into the drug class • Identify nursing considerations for patientstaking antihypertensive or antidiabetic and anti-asthma medications • Using pharmacology book, discuss the non-pharmacologicaland pharmacological management of hypertension, diabetesmellitus and asthma

				• Searching in library discuss on nursing considerations during hypertension,diabetes mellitus andasthma drug therapy
Links to other subjects: Human biology, fundamentals of nursing, medical pathology, and surgical pathology				
Assessment criteria: learner appropriately utilize the national treatment guidelines for non-communicable diseases in clinical practices on treatment of Hypertension, Diabetes, and Asthma.				
Materials: pharmacology book, National treatment guidelines for non-communicable diseases, National essential drug list, internet connectivity, and NCD drugs				

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