**FOM 2313 PHARMACOLOGY AND THERAPEUTICS 5 Weeks**

Course description

The Principles of Pharmacology and Therapeutics Course is a 5- credit unit course for Medical students. This course emphasizes on knowledge about drugs, their classification, therapeutic effects, anticipated reactions, toxic effects and abuse, legal ethical aspects and health workers responsibilities of rational use of medicines. It is designed to guide the students with essential information on drugs and

the scientific basis of their actions. The contents to be covered include (1) the general principles of

pharmacology involve pharmacokinetics, mechanisms of drug action dose-response relationships drug interaction and adverse effects, and (2) autonomic nervous system pharmacology.

The major objective of this course is to provide the medical students with a background in the fundamental principles of pharmacology and the basic properties of pharmacological agents so as the students progress in the training, the students will be prepared to use drugs appropriately, safely and effectively,

Principles of Pharmacology

Course Objectives:

1. Define key pharmacology terms and pharmacology related fields

2. Describe characteristics, classes & nomenclature of drugs

3. Describe the drug discovery process & clinical trials

4. Describe the pharmacokinetic properties of drugs including absorption, distribution , metabolism and excretion

5. Discuss factors that influence drug absorption, distribution, and elimination

6. Compare different routes, sub routes of drug administration

7. Distinguish among drug forms.

8. Describe commonly used drug abbreviations

9. Describe the pharmacodynamic effects of drugs

10. Describe drug receptor and non receptor mechanisms of drug action

11. Describe factors enhancing or antagonizing drug effects

12. Describe mechanisms of tolerance and tachyphylaxis

13. Analyse dose response curves

14. Determine the measurement of drug safety

15. Describe various drug interactions

16. To describe the principles of rational drug use

Autonomic Nervous system Pharmacology

Course Objectives:

1. Describe and contrast anatomic distribution of the autonomic nervous system

2. Describe the Synthesis, storage, release and termination of effects catecholamines

3. Outline the classification of autonomic agents

4. Describe the classification and clinical pharmacology of sympathomimetic agents

5. Describe classification and clinical pharmacology of Sympatholytic agents

6. Describe classification and clinical pharmacology of parasympathomimetic agents

7. Describe classification and clinical pharmacology of Parasympatholytic agents

8. Describe classification and clinical pharmacology of ganglion stimulating and blocking agents

9. Describe classification and clinical pharmacology of muscle relaxants

Expected Outcomes

On completion of this course, students will be able to:

1. Apply conceptual knowledge about the drugs used in different systems of the body and their effects, to ensure safe administration and effective patient education.

2. Utilize knowledge of the expected and adverse reactions of medications based on the understanding of the mechanism of actions of the drugs, to facilitate early recognition and effective management of side effects.

3. Explain the rationale for using a particular drug/s for a patient.

4. Selects appropriate interventions for drugs given in clinical situations.

5. Impart teaching to the patient/family based on accurate assessment of their learning needs.

6. Utilize the rational drug use process to evaluate the need for and the effectiveness of the drug/s given to the patients.

7. Relate legal and ethical issues to the administration of drugs.

8. Incorporate relevant research findings related to new drugs as a means of enhancing patient care and safety.

9. Incorporate cognitive, interpersonal and technical skills derived from the humanities, natural and behavioural sciences when administering medication to clients.

**Course outline**:

**Principles of Pharmacology and Therapeutics**

• Definitions & Classification: History of Pharmacology Definitions of Pharmacology & drugs, illicit & medicines, herbal medicines, biochemical and physiological changes, fields related to pharmacology, Pharnacokinetics and pharmacodynamics, Sources of drugs, Drug nomenclature, Drug Classification (OTC & Prescription).Process of Drug Development: Preclinical and clinical trials

• PharmacoKinectics: Routes of drug administration and their advantages & disadvantages, Factors influencing drug absorption, distribution, metabolism and excretion. Drug formulations and drug abbreviations.

• Pharmacodynamics: various drugs effects, desirable effects and undesirable, Types of Adverse effects; side effects, toxic effects, idiosyncratic, iatrogenic, teratogenic, hypersensitivity, Modes of drug action: receptor and non receptor mechanisms: Selectivity, affinity, intrinsic effects, efficacy, potency. Dose response curves, Biological and phamacogenetic factors influencing drug effects. Mechanisms of drug tolerance, habituation, addiction and physical dependence. Drug safety and interactions

• Rational drug use; principles of selection of drug; safety efficacy, cost and suitability. Causes and consequences of irrational drug use; indicators of irrational drug use; intervention for irrational drug use; educational regulatory.

**Autonomic Nervous System Pharmacology**

• Nervous System Physiology: Definitions, divisions of the NS, functions of the NS. Compare PNS & CNS, compare Somatic NS and ANS. Compare effects, functions & anatomy of the of Parasympathetic NS and Sympathetic NS

• Drugs affecting sympathetic NS: Synthesis, storage, release of neurotransmitters and receptor systems of the SNS. Location of receptors & the pharmacological effects of agonists and antagonists. Sympathomimetics agents & sympatholytic agents

• Sympathomimetics agents: Classification ; Catécholamine & non catecholamines

• Catecholamine: Natural (endogenous) and synthetic .Non catecholamine: indirectly, directly, dually acting. Especial attributes to AADME and Effects and mechanism of action. Sympatholytic agents: Classification: receptor classification, selective and non selective. Special attributes to AADME and Effects and mechanism of action of @ group

• Drugs affecting parasympathetic NS: Synthesis, storage, release of neurotransmitters and receptor systems of the PSNS. Location of receptors & the pharmacological effects of agonists and antagonists

• Parasympathomimetics agents: Classification; directly acting (Esters of choline & Plant alkaloids) and indirectly acting (Anticholinesterases).Especial attributes to AADME and Effects and mechanism of action. Parasympatholytic agents: Classification: Muscarinic and Nicotinic antagonists. Muscle relaxants: Depolarising and Nondepolarising. Special attributes to AADME and Effects and mechanism of action of @ group

• Ganglion Pharmacology: Ganglion facilitants and ganglion Blockers

• Special attributes to AADME and Effects and mechanism of action of @ group

Methods of Delivery

The course format consists of lectures, conferences, tutorial discussion and laboratory

Lecture: Lecture attendance is highly recommended, though it may not elaborate all the important aspects of the subject.

Conference: Conference is designed for review and discussion of important subject matters. Objectives, outline and key papers for the conference will be distributed in advance. The students are urged to read the given materials and papers before and present as well as take an active part in discussion. It is intended to provide an opportunity for student-teacher interaction. Two or more teachers are responsible for monitoring each conference group.

Student Presentation: Similar to the conference, the presentation will be performed totally by the students to give their opportunity to teach one another. In addition, this session is to stimulate the student to study by themselves the detailed content of some lectures.

Laboratory: Experimentation is the most important mode of learning in science. Therefore, there are 6 laboratory sessions in this course, including video presentation, lab demonstration and experiments on

animals.

Study Guide: A set of objectives and outline for each individual lecture will be provided. The students are encouraged to use the information as guideline for self-study and preparation for both lectures and examinations. It is reminded, however that the listed contents do not represent all areas of drugs that have to be known. Consultation with recommended textbooks is essential.

Students Evaluation Criteria

• Continuous assessment 40% Tutorial assessments 10%

Progressive assessment 30%

• End of Semester Examination (Duration: 3 hours) 60% Total 100%.

Course duration: 5 Weeks , 75 CH Resources

Resources available for conducting the course include:

• Teaching space: Utilize the Davis lecture theatre and the Microbilogy laboratory for lectures and conferences/seminars.

• Tutorial rooms: the existing 20 tutorial rooms under the college of health sciences will be utilized for the purpose of this course

• Laboratory space: The department of Pharmacology and Therapeutics Laboratory and the physiology laboratory will be utilized for this purpose.

Teaching Staff

|  |  |  |  |
| --- | --- | --- | --- |
| Name | Qualification | Dept. | Station |
| 1. Prof. Anokbonggo Willy | MBChB, MSc, PhD | Pharmacology & Therapeutics | Makerere |
| 2. Prof. Ogwal Okeng | MBChB, MSc, PhD | Pharmacology & Therapeutics | Makerere |
| 3. Ass. Prof Waako Paul | MBChB, MSc, PhD | Pharmacology & Therapeutics | Makerere |
| 4. Ass. Prof Celestino Obua | MBChB, MSc, PhD | Pharmacology & Therapeutics | Makerere |
| 5. Dr. Mwebaza Norah | MBChB, MSc | Pharmacology & Therapeutics | Makerere |
| 6. Dr. Bbosa Godfrey | Vet, MSc | Pharmacology & Therapeutics | Makerere |
| 7. Dr. Sarah Nanzigu | MBChB, MSc | Pharmacology & Therapeutics | Makerere |
| 8. Mr. Jackson Mukonzo | B. Pharm, MSc | Pharmacology & Therapeutics | Makerere |
| 9. Mr. Dan Kibuule | B. Pharm, MSc | Pharmacology & Therapeutics | Makerere |
| 10. Dr. Hindum Lanyero | BDS | Pharmacology & Therapeutics | Makerere |