YENEPOYA

(DEEMED TO BE UNIVERSITY)
Recognized under Sec 3(A) of the UGC Act 1956
Accredited by NAAC with 'A' Grade

YENEPOYA MEDICAL COLLEGE

PROGRAM OUTCOMES AND COURSE OUTCOMES

MSc MEDICAL PHARMACOLOGY

PROGRAM OUTCOMES

MSc Medical Pharmacology

(K=Knowledge, S=Skill, A=Attitude)

PO 1 The student should be able to explain clearly concepts and principles of Pharmacology and therapeutics. (K,S)

PO2 The student should also be able to explain the drug development processes. S/he should be able to explain Drugs and Cosmetics Act, in addition to clinical trial procedures. (K,S)

PO 3 The student should be able to effectively teach undergraduate students in allied health science courses (Dentistry and Nursing) so they become competent healthcare professionals and able to contribute to training of postgraduate trainees(K,S).

PO 4 The student should be able to carry out a research project (both basic and clinical) from planning to publication and be able to pursue academic interests and continue life-long learning to become more experienced in all the above areas and to eventually be able to guide postgraduates in their thesis work. (K,S,A)

COURSE OUTCOMES

CO 1	Describe and apply pharmacological principles to explain the mechanism/s of the effects of drugs used in diagnosis, prevention and treatment of diseases of all systems of human body.
CO 2	Explain Pharmacodynamics and pharmacokinetics of drugs.
CO 3	Describe mechanisms of drug-drug interactions and their clinical importance.
CO 4	Acquire knowledge on principles of pharmacoeconomics
CO 5	Acquire knowledge on pharmacoepidemiology, including drug utilization studies.
CO6	Aquire knowledge and understanding of principles of Good clinical practice GCP) and Good laboratory practice (GLP) guidelines
CO7	Acquire knowledge on essential medicines
C08	Acquire knowledge on pharmacovigilance
C09	Acquire knowledge and apply the principle of biostatistics in the evaluation and interpretation of drug safety and efficacy studies
CO10	Describe how to evaluate, analyse and monitor preclinical and clinical data in drug discovery
CO11	Able to integrate principles of immunology in biochemistry.
CO12	Demonstrate knowledge of basics of research methodology, develop a research protocol, conduct the study, record experimental observations, analyse data using currently available statistical software, interpret results and disseminate these results and to have the potential ability to pursue further specializations and eventually be competent to guide students.
CO13	Describe the principles of teaching - learning technology towards application and take interactive classroom lectures, modules for problem-based learning (PBL), case discussions, small group discussions, seminars, Journal club and research presentations.
CO14	Demonstrate knowledge about computer assisted learning (CAL) softwares and ability to use them efficiently to promote learning of pharmacology.
CO15	Demonstrate knowledge of principles of Instrumentation.
CO16	Demonstrate knowledge about recent advances and trends in research in the field of pharmacology and clinical pharmacology
CO17	Acquire knowledge on generic drugs.
CO18	Aquire knowledge about antimicrobial stewardship programs and strategies for containment of antibiotic resistance.
CO19	Acquire knowledge on animal toxicity studies.

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CO20 Acquire knowledge on common poisoning.

CO21 Acquire knowledge on the legal and ethical issues involved in drug development and research.

CO22 Acquire knowledge in Biostatistics including use of statistical softwares:
- Estimation Sample size for a clinical trial
- Scales of measurement, data display, measures of central tendency (mean, median, mode)
- Dispersion of data (variance, standard deviation)
- Selection of tests (of significance) and their applicability
- Correlation and regression analysis
- Basics of systematic reviews and meta-analysis

CO23 Effectively explain to patients, the effects and side effects of drugs, including the need for medication adherence.

CO24 Communicate effectively with pharmacological reasoning with students, peers, staff and faculty, and other members of the health care team on rational use of drugs and improving spontaneous reporting of adverse events.

CO25 Demonstrate respect in interactions with peers, and other healthcare professionals.

CO26 Demonstrate ethical behavior and integrity in one's work

CO27 Demonstrate ability to generate awareness about the use of generic drugs in patients.

CO28 Acquire skills for self-directed learning to keepup withdevelopments in thefield and to continuously build to improve on skills, expertise and perpetual professional development.

CO29 Able to predict efficacy and adverse effects associated with use of drugs, along with causality assessment.

CO30 Perform major *in vivo* and *in vitro* animal experiments.

CO31 Observe and understand basic principles of working of important advanced techniques, like High Performance Liquid Chromatography (HPLC).

CO32 Demonstrate standard operating procedures of various methods and techniques used in clinical trials and research.

CO33 Determine levels of common poisons in blood

CO34 Demonstrate presentation skills at academic meetings, publications and writing research projects for funding agencies.

CO35 Be able to analyze and evaluate a research paper

CO36 In vivo and ex vivoexperiments, like organ bath, analgesiometer, physiography/ polygraph, convulsiometer, plethysmograph, learning and memory, models for affective disorders.

CO37 Administration of drugs by various routes (subcutaneous, intravenous, intraperitoneal) in experimental animals

CO38 Collection of blood samples and oral gavage in experimental animals

CO39 Preparation and administration of a drug solution in appropriate strength and volume

C040 Experiments to show dose response curve of agonists (in the presence or absence of an antagonist) on various biological tissues, like i) Isolated rabbit/rat/ guinea-pig intestine ii) Isolated rat uterus

CO41 Determination of EC50, ED50, pD2 and pA2 values of drugs

CO42 Perform *in vivo* experiments to study effect of mydiatrics and miotics on rabbit eye

CO43 Perform *in vivo* experiments to study effect of antiepileptic drugs using animal models of epilepsy

CO44 Perform *in vivo* experiments to study effect of analgesics using animal models of analgesia

CO45 Perform *in vivo* experiments to study effects of drugs on learning, memory and motor coordination

CO46 Estimate toxic drug levels using chemical and biological tests (alkaloids, glycosides, steroids, barbiturates, salicylates) by commonly used methods)

CO47 Clinical pharmacology
i. Prepare protocol for a clinical trial
ii. Prepare Informed consent form and participant information sheet for research involving human participants
iii. Report Serious Adverse Effect (SAE)
iv. Evaluate promotional drug literature v. Prepare "Drug Information Sheet" (WHO criteria)
vi. Interpret bioavailability parameters with the help of given pharmacokinetics data
vii. Perform causality assessment and report ADR as per Pharmacovigilance Programme of India (PvPI).