

## ANNEXURE 1: Summary of difference in the newer and older guidelines for PG training programme for MD pharmacology

The postgraduate guidelines for competency-based postgraduate training programme for MD pharmacology was designed by Medical council of India (May 2018). This has been replaced by the National Medical Council on 1<sup>st</sup> August 2022. There has been a major revision in the curriculum as well as syllabus for the MC pharmacology course.

The following are the ADDITIONS to the existing guideline in the newer guideline.

- Preamble: the newer guideline emphasises on the clinical application of pharmacology concepts is essential for rational prescribing practices, rational therapeutics, clinical trials, rational use of drugs including antimicrobials, pharmacovigilance and pharmacology consults.
- Subject Specific Learning Objectives (GOALS):
  - Acquisition of knowledge: the additional concepts added were health economics.
  - Acquisition of Skills: This para was newly added expecting skills in pharmacology-based services (e.g. rational prescribing), in self-directed learning for evolving educational needs and scientific information, in conduct of research and in managerial assignments in the department/institution
  - Professionalism, Ethics and Communication skills: Newly added for acquisition of principles of professionalism, ethics and effective communication in conduct of research, pharmacology-based services, educational activities and day-to-day work.
- Subject specific competencies:
  - Cognitive domain
    - General pharmacology: Demonstrate an awareness of the historical journey and contributions of scientists in the drug development process.
    - Research: Demonstrate an understanding of the principles of Good Publication practices as applicable to publication of research studies.
    - Teaching and assessment: 1. Demonstrate an awareness about the salient features of Undergraduate Medical Education Curriculum in India. 2. Demonstrate an awareness about Postgraduate Medical Education Curriculum and Guidelines in India
  - Psychomotor domain: Competencies under this domain are divided into
    - Mandatory:
      - To be done Independently or as a part of team: 1. Administer Informed Consent Form, 2. Prepare 'Package insert'
      - To be done under supervision: 1. Demonstrate skills for contributing to antibiotic stewardship program of the institute to manage antimicrobial resistance. 2. Administer drugs by various routes (subcutaneous, intravenous and intraperitoneal) in simulations and hybrid models.
    - Desirable: Nil
    - Note: Estimation of toxic levels of drugs using chemical and biological tests, Reporting Serious Adverse Events and Preparing drug information sheet has been removed in new guideline.
- Syllabus: The following content was added in the new guideline-
  - Clinical pharmacology: the following topics were newly added
    - Functioning of the Drugs and Therapeutics Committee.
    - Hospital formulary development.
    - Drug information services.
    - Medication error detection and mitigation advice.
    - Antimicrobial resistance and antibiotic stewardship.
    - Prescription auditing
    - Drug counselling - explain to patients, the effects and adverse effects of drugs, including the need for medication adherence
    - Emergency drugs used in crash cart/resuscitation
  - Drug development research and Regulations: Emergency use authorisation for drugs, for example vaccine development.
  - Education:

- Salient features of Undergraduate Medical Education Curriculum in India.
- Postgraduate Medical Education Curriculum and Guidelines in India.
- Principles of teaching - learning methods and technology
- Principles of assessment of learners
- Teaching learning methods:
  - The lectures topics (minimum 10/year) to be covered for PG students have been enlisted.
  - Laboratory work/Bedside clinics: DOAP (Demonstrate, Observe, Assist, Perform), simulations in skill laboratory and case-based discussions etc.
  - Rotational clinical/community/institutional postings: Depending on local institutional policy and the subject specialty needs, postgraduate trainees may be posted in relevant departments/units/institutions. The aim would be to acquire more in-depth knowledge as applicable to the concerned specialty. Postings would be rotated between various units/departments (details provided in the guideline).
  - Posting under 'District Residency Programme' (DRP): Compulsory rotation of 3 months in District Hospitals/District Health System as a part of the course curriculum, as per the Postgraduate Medical Education (Amendment) Regulations (2020). Such rotation shall take place in the 3<sup>rd</sup> or 4<sup>th</sup> or 5<sup>th</sup> semester of the Postgraduate programme and the rotation shall be termed as 'District Residency Programme' and the PG medical student undergoing training shall be termed as 'District Resident'. Every posting should have its defined learning objectives. It is recommended that the departments draw up objectives and guidelines for every posting offered in conjunction with the collaborating department/s or unit/s. This will ensure that students acquire expected competencies and are not considered as an additional helping hand for the department/unit in which they are posted. The PG student must be tagged along with those of other relevant departments for bedside case discussion/basic science exercises as needed, under the guidance of an assigned faculty.
  - Teaching research skills: In addition to the thesis project, every postgraduate trainee shall participate in at least one additional research project that may be started or already ongoing in the department. It is preferable that this project will be in an area different from the thesis work. For instance, if a clinical research project is taken up as thesis work, the additional project may deal with community/field/laboratory work. Diversity of knowledge and skills can thereby be reinforced.
  - Training in teaching skills: Medical Education Unit/Department of Medical education should train PG students in education methodologies and assessment techniques. The PG students shall conduct UG classes in various courses and a faculty shall observe and provide feedback on teaching skills to the student.
  - Logbook: The record of various activities that should be mentioned in the logbook has been enlisted. The expectations from PG student and PG teachers have been stated.
  - Other:
    - The postgraduate trainees must undergo compulsory training in Basic Cardiac Life Support (BCLS) and Advanced Cardiac Life Support (ACLS).
    - The postgraduate trainees should preferably undergo training in Good Clinical Practice (GCP)
- Assessment:
  - Formative assessment: in the quarterly assessment the Case presentation, case work up, case handling/management are to be conducted once in a week. Students are also required to attend scientific meetings, CME programme (at least two each). Emphasis is given over presence of all teachers of department in the assessment.
  - Summative assessment: The latest postgraduate medical education regulations shall be applicable for the summative assessment.
    - The following prerequisites have been added for eligibility to appear for examinations-
      - Completed Logbook.
      - Two presentations at national level conference, one research paper in an indexed journal
    - Examination consists of three parts:
      - Thesis (Submitted 6 months before the date of examination)
      - Theory examination
        - Paper I has been renamed as basic sciences as applied to pharmacology (instead of general pharmacology)
        - Paper II is now Systemic Pharmacology instead of Clinical Pharmacology
        - Paper III is now Clinical Pharmacology instead of Systemic Pharmacology. Experimentation, Research, Biostatistics and Education have been added to this paper.
        - Paper IV – No change.

- Practical examination
  - Long exercises – Case audit has been added.
  - Short exercises – Demonstration of effects of drugs/interpretation of results in human and Demonstration of effects of drugs/interpretation of results in small, animals – optional (as per Regulations notified) have been added.
  - OSPE exercises have been newly added. Most of the content under OSPE was a part of Long or Short experiments. The newly added exercises are – A. Selecting a P-drug and writing rational prescriptions. B. Analytical instruments – use and interpretation. C. Identifying ethics related dilemmas/mistakes in clinical trial documents
  - Assessment of teaching/presentation skills have been separated from Viva voce which consists of presentation of a UG lecture, making question paper, learning objectives, discussion on dissertation, etc.
- Student appraisal form for MD in pharmacology has been revised as following:
  - The particulars (total 7) in the older guideline have been renamed as elements (total 5) and sub elements (Total 16).
  - The following new elements have been added:
    - Scholastic aptitude and learning
      - Has knowledge appropriate for level of training
      - Performance in work-based assessments
    - Work related to training
      - Respect for processes and procedures in the work space
      - Ability to work with other members of the team
      - Participation and compliance with the quality improvement process at the work environment.
      - Ability to record and document work accurately and appropriate for level of training
    - Professional attributes
      - Responsibility and accountability
      - Contribution to growth of learning of the team
      - Conduct that is ethically appropriate and respectful at all times
    - Disposition
      - Has this assessment pattern been discussed with the trainee? If not, give reasons.

## ANNEXURE 2: Questionnaire

Qualification – MBBS (PG Student)/MD pharmacology/DM clinical pharmacology.

Place of work – Pharmaceutical company/Hospital/Academic institution/Drug regulator.

Professional experience in years-

1. With respect to the Research domain, give your opinion regarding the following requirement added in the program. Students are required to conduct additional research projects outside of their thesis work, Training in Good Publication practices, two presentations at national level conference and one research paper in an indexed journal are required. Students are also required to Attend scientific meetings, CME programme (at least two each). Will these changes be beneficial for development of research aptitude among the Students?
2. With due respect to the expanding scope of pharmacology, is it necessary to include the following topics under clinical pharmacology? (Functioning of the drugs and therapeutics committee; hospital formulary development; drug information services; medication error detection and mitigation advice; antimicrobial resistance and antibiotic stewardship; drug counselling; and emergency drugs used in crash cart/resuscitation have been newly added in the clinical pharmacology).  
CHECK BOX
3. Case presentation, case work up and case handling/management have been newly added to the formative assessment. Will these changes be beneficial for the overall academic growth of the Students?
4. In the summative assessment, case audit in long exercise and demonstration of effects of drugs/interpretation of results in human in short exercise has been included in the study. OSPE exercises have been newly added, which covers many topics which were previously under short and long exercises. The exercises of Selecting a P-drug and writing rational

prescriptions and Identifying ethics related dilemmas/mistakes in clinical trial documents have been newly added. Furthermore, assessment of teaching/presentation skills has been separated from Viva voce. Do you agree with the changes in the summative assessment made? Check box

5. The revised student appraisal form has been elaborated with elements (scholastic aptitude and learning, work related to training, professional attributes and disposition) and sub elements. Will this pattern help in overall assessment of the students?
6. Is there a potential benefit in the mandatory rotational postings in relevant departments/units/institutions for MD pharmacology trainees?
7. Will training in teaching skills provided by the Medical Education Unit or Department of Medical Education for students have a significant impact on Student's overall growth?
8. Do you think that inclusion of *in vivo/in vitro* animal experiments as desirable instead of mandatory is need of the hour?
9. The Posting under 'District Residency Programme' (DRP) of 3 months in District Hospitals/District Health System as a part of the course curriculum is mandatory for all postgraduate students. The posting will ensure that students acquire expected competencies. Do you suppose the inclusion of DRP as an important aspect of curriculum revision?
10. Overall, do you think the new revision of MD pharmacology curriculum was necessary?
11. Will the implementation of the new curriculum be a challenging task for the teaching faculty?
12. What according to you are the advantages of the new curriculum?
13. What are the shortcomings of the new curriculum?