



GUEST LECTURE

Saturday, 28th January, 2023, 3 PM



Highlights of recent NMC guidelines PG Training programme for MD in Pharmacology

MODERATOR



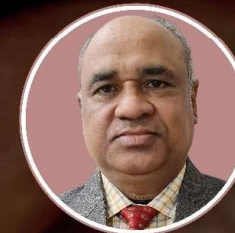
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SPEAKER



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Organized by Department of Pharmacology & Therapeutics King George's Medical University, Lucknow
In association with National Association of Pharmacology & Therapeutics

This presentation

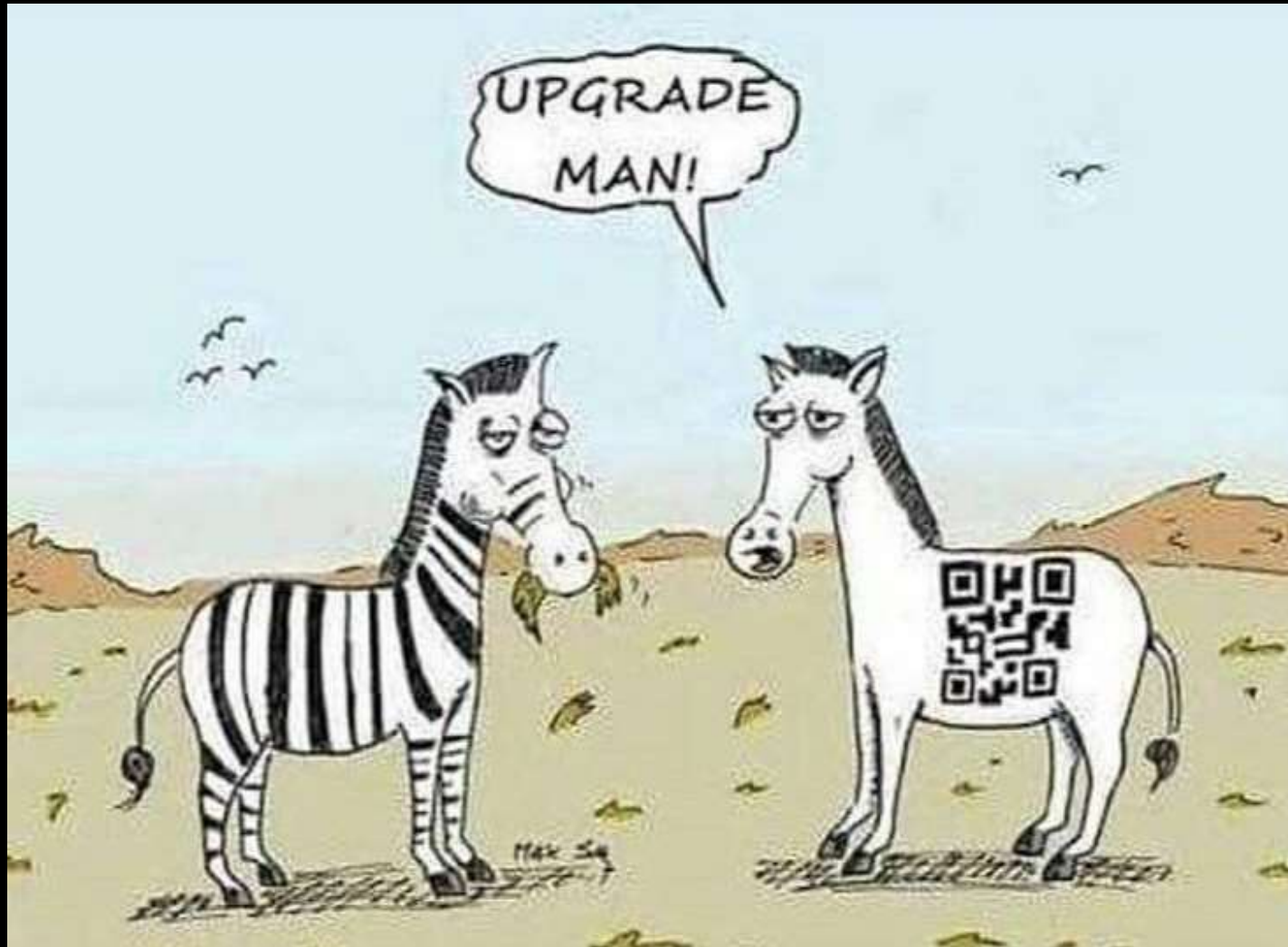
- Relevance of recent NMC guidelines in current scenario
- Teaching and learning methods for PG MD Pharmacology
- Assessment of Post graduate MD Pharmacology
- Bedside correlation of pharmacology

RELEVANCE OF CURRENT NMC GUIDELINES

“Are our MD training programs adequate for the students, satisfying their future career?”



- Medical science is changing on weekly basis
- Are we changing our training with time and demand?

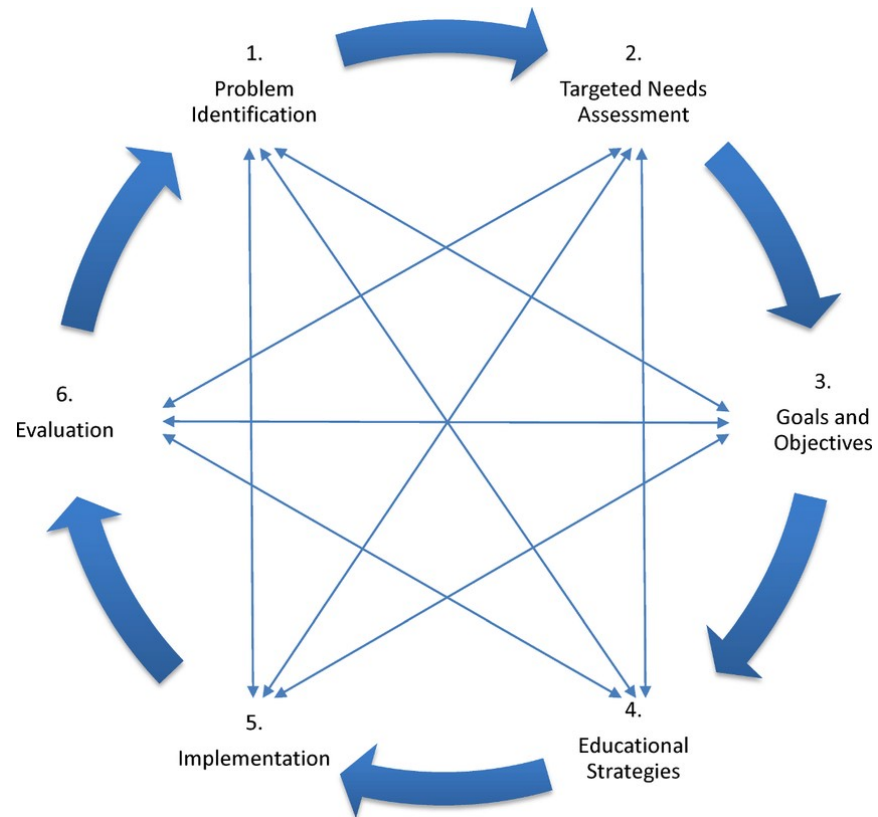


Careers after MD Pharmacology!

PHARMACOLOGY

A collection of pharmaceuticals is displayed on a dark, reflective surface. In the background, an orange pill bottle lies on its side, spilling out numerous yellow, heart-shaped capsules. In the foreground, a large number of white, round tablets are scattered. A medical syringe with a green plunger and a yellow barrel is positioned diagonally across the middle of the frame. The syringe's barrel has black markings for volume, ranging from 10 to 60. The word 'PHARMACOLOGY' is superimposed in large, white, sans-serif capital letters across the center of the image.

6 Steps in MD Pharmacology Curriculum development



MD Pharmacology

Requisite

- All students joining the postgraduate courses shall work as full-time (junior) residents during the period of training,
- Attendance not less than 80% of the training activity during the calendar year, and participating in all assignments and facets of the educational process.
- Maintenance a log book for recording the training they have undergone, and details of the procedures done during laboratory and clinical postings in real time.



MD Pharmacology

Subject based learning objectives

Divided in three parts

Cognitive domain

- General Pharmacology
- Systemic Pharmacology
- Research

Affective domain

- Adverse drug reactions
- Rational use of medicine
- Medication adherence
- Drug interactions
- Awareness about generic drugs
- Interactions with patients, health care professionals

Psychomotor domain

Independent or Part of team or Interpretation of results

- **Mandatory**
- Desirable



As per recent NMC guidelines for MD Pharma

MD Pharmacology

Subject based learning objectives ★

Psychomotor domain (Mandatory)

- ADR causality assessment
- Prescription analysis/audit
- Use of equipments (e.g. Analgesiometer, Physiograph, ECG)
- Preparing drug solutions/Determine EC_{50} , ED_{50} , pA_2 /Drug dosage
Calculations/Interpretation dose response curve/Interpretation pharmacokinetic data
- Presentation in classroom/clinical meetings
- Critical appraisal of research paper
- Preparing documents related to clinical trial (Informed consent form, Protocol writing)
- Evaluation Drug promotional literature
- Preparing document related to Pharma industry (Package insert)



As per recent NMC guidelines for MD Pharma

MD Pharmacology

Subject based learning objectives ★

Psychomotor domain (Mandatory)

- Clinical Pharmacology exercises (Memory, Psychomotor, Pain, Cardiovascular, Respiratory)
- Exercise related to Therapeutic Drug monitoring
- Exercise related to antibiotic stewardship
- Preparing documents SOP related to techniques used in pharmacology/research/clinical trial
- Route of drug administration under simulation
- Writing skills for scientific publication, research projects by funding agencies, ethics committee
- Skills related to scientific writing



As per recent NMC guidelines for MD Pharma

RECENT IMPORTANT GUIDELINES

PG Log book ★

- Every postgraduate student should maintain a PG Log book.
- Provide feedback and assess the progress of learning
- PG students shall be trained to reflect and record their reflections in log book
- Log book in original to be produced at the time of final practical examination.
- A proficiency certificate from the Head of Department in Log book.
- Signed by the guide and head of the Department
- Log Book should be used in the internal assessment of the student
- Log book should be checked and assessed periodically by the faculty members
- All log book entries must be done in real time.

Records in PG Log book

- Details and duration of the postings/work done (e.g. Wards, OPDs, Casualty)
- Procedures assisted and performed during postgraduate period.
- Details of presentation given in the department
- Details of teaching and training session attended
- Details of acquisition of competencies.
- Students shall be trained to reflect and record their reflections in log book

Exposure to seminars/symposia/Conference ★

Current NMC recommendations



- Trainees shall attend accredited scientific meetings (CME, symposia, and conferences) at least once a year.
- At least 3 during entire duration of PG course.

Paper/poster presentation/publication



Current NMC recommendations



- At least two presentation at national level conference
 - One research paper should be published/accepted in an indexed journal
- (It is suggested that the local or university review committee assess the work sent for publication)

Training for PGs ★



- Postgraduate trainees must undergo compulsory training in Basic Cardiac Life Support (BCLS) and Advanced Cardiac Life Support (ACLS).

★ As per recent NMC guidelines for MD Pharma

Computer/internet training for PGs ★



- Postgraduate trainees must undergo training in information technology and use of computers.

★ As per recent NMC guidelines for MD Pharma

Training for PGs ★



- Postgraduate trainees should preferably undergo training in Good Clinical Practice (GCP)

★ As per recent NMC guidelines for MD Pharma

Animal Experiments



Current status in MD Pharmacology training

- Animal experimentation is desirable not mandatory by now
- Animal Experiments: All animal experiments must be compliant with the Regulations of Government of India, notified from time to time. **Amphibian/Dog/Cat experiments should be conducted by computer assisted simulation models/facilities.**
- Other experiments can be performed, but as permissible by existing 'Committee for the Purpose of Control and Supervision of Experiments on Animals (CPCSEA)' guidelines and other Government regulations.



As per recent NMC guidelines for MD Pharma

Records in PG Log book ★

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TEACHING LEARNING METHODS

For

MD Pharmacology students

MD Pharmacology

Teaching learning methods

- Demonstrations
- Symposia
- Journal clubs
- Clinical meetings
- Seminars
- Small group discussions
- Bed-side teaching
- Case-based learning
- Simulation-based teaching
- Self-directed learning
- Integrated learning
- Interdepartmental meetings

 As per recent NMC guidelines for MD Pharma

PG LECTURES

- Didactic lectures should be used sparingly.
- A minimum of 10 lectures per year in the concerned PG department is suggested.
- **Suggested topics for lectures**

Subject related important topics

Recent advances

Research methodology and biostatistics

Salient features of Undergraduate/postgraduate medical curriculum

Teaching and assessment methodology

Toxicity studies

Screening for pharmacological activity of drugs

Technical and ethical issues in clinical research and practice

Good laboratory practice

Good manufacturing practice

Health economics

JOURNAL CLUB

- Minimum of once in 1-2 weeks is suggested.
- Topics will include presentation and critical appraisal of original research papers published in peer reviewed indexed journals.
- The presenter(s) shall be assessed by faculty and grades recorded in the logbook.

STUDENT SEMINAR

- Minimum of once every 1-2 weeks is suggested.
- Important topics should be selected as per subject requirements and allotted for in-depth study by a postgraduate student.
- A teacher should be allocated for each seminar as faculty moderator to help the student prepare the topic well.
- It should aim at comprehensive evidence-based review of the topic.
- The student should be graded by the faculty and peers.

STUDENT SYMPOSIUM

- Student Symposium: Minimum once every 3 months.
- A broad topic of significance should be selected, and each part shall be dealt by one postgraduate student.
- A teacher moderator should be allocated for each symposium and moderator should track the growth of students during moderation.
- It should aim at complete evidence-based review of the topic. All participating postgraduates should be graded by the faculty and peers

Laboratory work / Bedside clinics

- Laboratory work / Bedside clinics: Minimum - once every 1-2 weeks.
- Laboratory work/clinics/bedside teaching should be coordinated and guided by faculty from the department.
- Various methods like DOAP (Demonstrate, Observe, Assist, Perform), simulations in skill lab, and case-based discussions etc. are to be used.
- Faculty from the department should participate in moderating the teaching-learning sessions during clinical rounds.

Interdepartmental colloquium

- Faculty and students must attend monthly meetings between the Department of Pharmacology and another department or departments on topics of current/common interest or clinical cases

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.

MD Pharmacology ★

Postings schedule with duration is given below:

Medicine	2 weeks
Hospital Pharmacy (If available)	1 week
Microbiology Department/ Infection control unit	2 weeks
Biochemistry	2 weeks
Anaesthesia	2 weeks
Dermatology	1 week
Medical oncology	2 weeks (if available)
Clinical trial unit/Research unit/Pharmaceutical industry	2-8 weeks (as per availability)
Medical Education unit/Department of medical Education (DOME)	1 week (optional)

★ As per recent NMC guidelines for MD Pharma

Posting under “District Residency Programme” (DRP)



- Designation during posting : District Residents
- Compulsory rotation of three months in District Hospitals/District Health System
- 3rd or 4th or 5th semester
- Offered in conjunction with the collaborating department/s or unit/s.
- Students acquire expected competencies
- Should not be considered as an additional helping hand for the department/unit
- Opportunities to present and discuss infectious disease cases through bedside discussion and ward/grand rounds with specialists/clinicians in different hospital settings to address antimicrobial resistance issues and strategies to deal with it.



As per recent NMC guidelines for MD Pharma

Training in teaching skills★

- Train student with teaching methodologies, and assessment methods
- Through Medical Education Unit (MEU)/ Department of Medical education (DOME)
- PG students shall conduct UG classes in various courses
- Faculty to observe and provide feedback on teaching skills

Course in Research Methodology



BCBR (Basic course in Biomedical Research)

Indian Council of Medical Research, New Delhi and
ICMR-National Institute of Epidemiology, Chennai

- All postgraduate students shall complete an online course in Research Methodology within six months of the commencement of the batch and generate the online certificate on successful completion of the course.
- Certificate can be attached in Thesis
- Certificate can be attached in PG Log book



Additional research project ★

- Different from the thesis work
- To reinforce diversity of knowledge and skills
- One additional research project started or already ongoing in the department.
- Eg. if thesis is on clinical topic research project may be community/field/laboratory work.

ASSESSMENT OF PG MD PHARMACOLOGY

Assessment of PG MD Pharmacology

Quarterly Formative assessment during the MD training ★

Should be based on

- Case presentation/Case work up, Case handling/management : once a week
- Laboratory performance : twice a week
- Journal club : once a week
- Seminar : once a fortnight
- Case discussions : once a month
- Interdepartmental case or seminar : once a month

★ As per recent NMC guidelines for MD Pharma

Assessment

Formative assessment

- The formative internal Assessment should include quarterly assessment.
- The internal assessment should be conducted in theory and practical/clinical examination
- Should, cover all domains of learning and used to provide feedback to improve learning
- It should also cover professionalism and communication skills.
- All teachers of the Department should be involved in assessment
- The student to be assessed periodically as per categories listed in postgraduate student appraisal form

Assessment

Quarterly Formative assessment during the MD training

Should be based on

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- Interdepartmental case or seminar : once a month

Essential pre-requisites for appearing for examination include

1. Completed Log book in original to be produced at the time of final practical examination..
2. At least two presentations at national level conference during postgraduate period. (details in Logbook)
3. One research paper should be published / accepted in an indexed journal.

It is suggested that the local or University Review committee assess the work sent for publication)

SUMMATIVE ASSESSMENT

- Assessment at the end of training
- Theory examination shall be held in advance before the Clinical and Practical examination
- Answer books to be assessed and evaluated before the commencement of the clinical/Practical and Oral examination.

MD (Pharmacology)

SUMMATIVE ASSESSMENT

To be conducted in three parts

Thesis

Theory examination

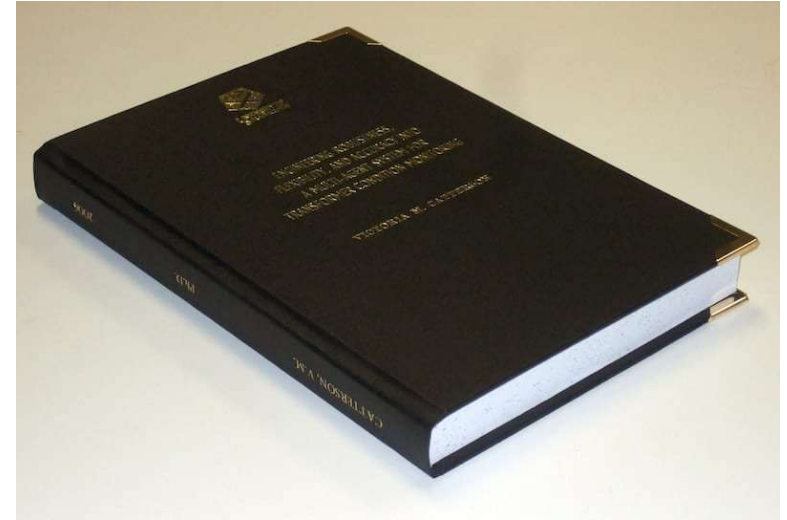
Practical examination

Teaching research skills

Thesis work

- Writing a thesis should be used for inculcating research knowledge and skills.
- All postgraduate students shall conduct a research project of sufficient depth to be presented to the University as a postgraduate thesis
- Thesis work to be under the supervision of an eligible faculty member of the department as guide
- One or more co-guides who may be from the same or other departments.

Thesis



- Submitted at least six months before the Theory and Clinical / Practical examination.
- Examined by a minimum of three examiners
- One internal and two external examiners, who shall not be the examiners for Theory and Clinical examination.
- Acceptance of thesis is mandatory to appear for the Theory and Practical/Clinical examination.

Additional research project ★

- Different from the thesis work
- To reinforce diversity of knowledge and skills
- One additional research project started or already ongoing in the department.
- Eg. if thesis is on clinical topic research project may be community/field/laboratory work.

Theory examination



- The examination for M.D shall be held at the end of 3rd academic year
- The examinations shall be organized on the basis of 'Grading' or 'Marking system' to evaluate knowledge, skill and competence.
- Obtaining a minimum of 50% marks in 'Theory' as well as 'Practical' separately shall be mandatory for passing examination as a whole.
- There shall be four theory papers
 - **Paper I:** Basic sciences as applied to Pharmacology
 - **Paper II:** Systemic Pharmacology
 - **Paper III:** Clinical Pharmacology, Experimentation, Research, Biostatistics and Education
 - **Paper IV:** Recent advances in the Pharmacology

Practical/clinical examination MD Pharmacology

- Practical examination should be spread over **two** days
- Include various major components of the syllabus focusing mainly on the **psychomotor domain**

MD (Pharmacology)

PRACTICAL EXAMINATION

(As per recent NMC guidelines)

Long exercise

Short exercises

OSPE/OSCE exercises

Grand Viva

Presentation

MD (Pharmacology)

PRACTICAL EXAMINATION

(As per recent NMC guidelines)

Long exercise

- Protocol designing
- Case audit
- Perform experiments or simulated experiments (as per PG Regulations)

Short exercises

- Demonstration of effects of drugs/interpretation of results in human
- Demonstration of effects of drugs/interpretation of results in small, animals (optional) as per regulations.
- Interpretation of results of a previous tracing - Table exercise

OSPE/OSCE exercises

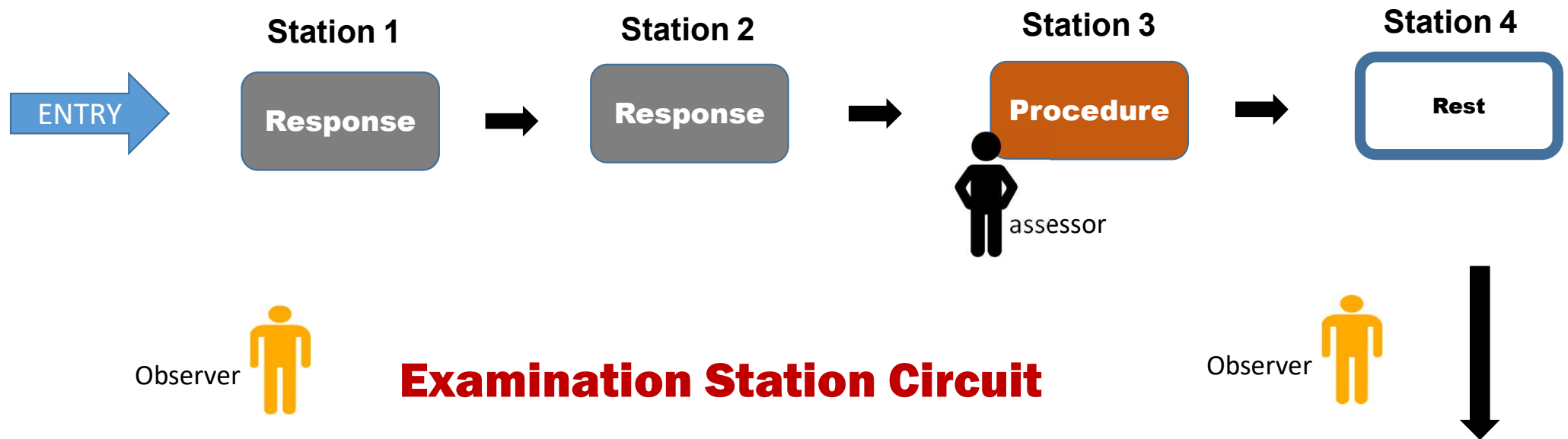
- 10-15 stations.
- Stations should be mixture of observed (observer present) and unobserved stations

Grand Viva

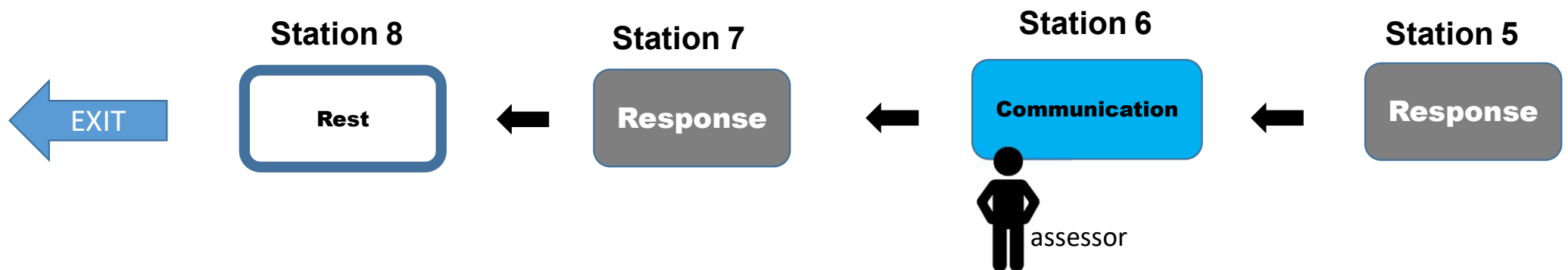
Preferably conducted by each examiner separately

Presentation

- Microteaching
- Thesis presentation



The Examination stations should be clearly marked in a logical sequence that allows easy, unimpeded transit from one station to the next.





SUMMETIVE ASSESSMENT PG MDPHARMACOLOGY

Suggested OSPE/OSCE during MD Pharmacology examination

- Various drug delivery systems
- Calculating pharmacokinetic parameters
- Pharmaceutical calculations
- Statistical exercise
- Pharmacoeconomics
- Critical appraisal of a published paper
- Abstract writing of a published paper
- Evaluation of drug promotional literature.
- Adverse Drug Reaction (ADR) reporting and causality assessment
- Assessment of preclinical toxicity data
- Analysis of rational and irrational formulations
- Selecting a P-drug and writing rational prescriptions
- Analytical instruments - use and interpretation
- Identifying ethics related dilemmas / mistakes in clinical trial documents

Bedside correlation of Pharmacology & Therapeutics

Exposure to clinical skills ★

- Thesis topic related to clinical domain ★
- Posting in clinical departments ★
- District residency programs as suggested by NMC ★
- Training in clinical skills (BCLS, ACLS) ★

PLEASE NOTE: There is sufficient scope of clinical skills now in MD Pharmacology curriculum

★ As per recent NMC guidelines for MD Pharma



Clinical correlation of teaching and training in MD pharmacology

Teaching and training in MD pharmacology



Bench to bedside

Interdepartmental participation in clinical case presentation



ASSIGNMENTS

To be completed in OPD/Ward/Emergency/Pharmacy



Helps student to correlate Pharmacology with clinical practice

DEPARTMENT OF PHARMACOLOGY AND THERAPEUTICS
SMMH Govt medical College Saharanpur

SHORT ASSIGNMENT

CASE SHEET

Bedside Learning in Pharmacology & Therapeutics

Student information

Assignment number: 09 Batch /Roll Number 2015/43
Submitted by : Gaurav Kumar Date of submission 12/10/2017
Title of assignment: Clinical study of liquid dosage form)

Patient information

Name of Patient: Usman Age: 04 Yr Sex: Male Weight 14 kg
Address: Village Malihpur Post Office Nanauta Saharanpur UP
OPD /Ward Number OPD 06 /Pediatrics Bed number: 22
Date visit/admission: 13/10/2017
Department: Pediatrics
Consultant incharge: Dr Mandeep Singh MD
Diagnosis Infective Gastroenteritis



Simulation Lab (ROMA LAB)



CAL Lab (Computer assisted Lab)





Clinical research division/BA/BE Simulation Lab

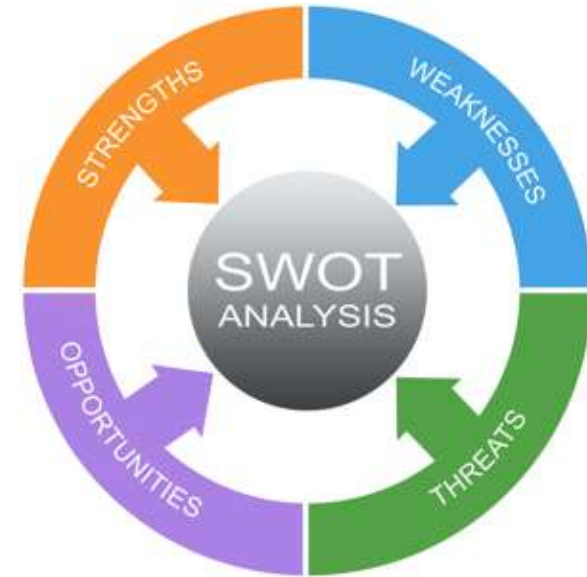
ROMA (Route of medication administration) LAB





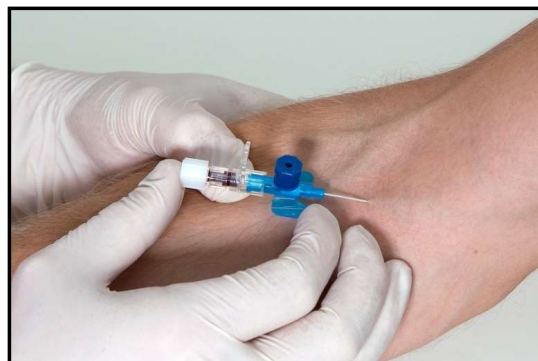
Bedside correlation of pharmacology

Clinical correlation of teaching and training in MD pharmacology



Challenges

1. Overcrowded wards
2. Lack of cooperation by colleagues of clinical departments
3. Disturbance of ward atmosphere by the presence of teaching students
4. Medicine issued by hospital kept by nursing incharge
5. Lack of faculty training
6. Lack of desire by faculty member for a change(extra burden/extra work)



Newer modules for teaching Pharmacology and therapeutics

CASE STUDY



SHORT ASSIGNMENTS

To be completed in OPD/Ward/Emergency/Pharmacy



Helps student to correlate Pharmacology with clinical practice

Highlights of recent NMC curriculum in MD pharmacology

- Medical education
- Involvement of PG in UG teaching
- Postings in Clinical departments
- District residency programme
- ACLS BLS training
- Participation National workshop
- Paper/poster presentation
- BCBR cycle training
- GCP training

Suggested reforms

- Modification of teaching learning methods
- Modification in methods of assessment
- Professional exposure to computer/internet assisted learning
- Industry/Clinical research posting/exposure
- Exposure to bed side teaching
- Sessions on correlation of pharmacology to therapeutics
- Exposure to clinical practice

Reference

**Revised Guidelines for competency
based MD in Pharmacology Dated
02/08/2022**

Available on www.nmc.org.in

NATIONAL MEDICAL COMMISSION
Postgraduate Medical Education Board

D 11011/1/22/AC/Guidelines/PG 08

Date: 01-08-2022

National Medical Commission
GUIDELINES FOR COMPETENCY
BASED
POSTGRADUATE TRAINING
PROGRAMME FOR MD IN
PHARMACOLOGY

Gratitude

- **Dr. S P Dhaneria Formerly Professor & Head(Pharmacology) AIIMS Raipur**
- **Dr. Dinesh K. Badyal Professor (Pharmacology) CMC Ludhiana**
- **Dr. R K Dixit KGMU Professor (Pharmacology) KGMU Lucknow**
- **Dr. A. K. Sachan Professor and Head (Pharmacology) KGMU Lucknow**
- **Dr. Padmaja Udaikumar Professor & Head (Pharmacology) FMMC Mangalore**
- **Dr. Chetna K. Desai Professor and Head(Pharmacology) BJMC Ahmedabad**
- **Dr. Ganesh N. Dakhale Professor and Head(Pharmacology) AIIMS Nagpur**
- **Dr. Geeta A Professor and Head (Pharmacology) Bangalore**
- **Dr. Sukanta Sen Professor & Head (Pharmacology) Icare Institute Kolkata**

THANKS



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