

Learning outcomes

A post graduate student, upon successfully qualifying in the M.D (Forensic Medicine) examination, should be able to:

1. Become an expert in Forensic Medicine.
2. Identify and define medico-legal problems as they emerge in the community and work to resolve such problems by planning, implementing, evaluating and modulating Medico- legal services.
3. Undertake medico-legal responsibilities and discharge medico-legal duties in required settings.
4. Keep abreast with all recent developments and emerging trends in Forensic Medicine, Medical Ethics and the law.
5. Deal with general principles and practical problems related to forensic, clinical, emergency, environmental, medico-legal and occupational aspects of toxicology.
6. Deal with medico-legal aspects of Psychiatry, mental health and drug addiction.
7. Impart education in Forensic Medicine and Toxicology to under-graduate and post-graduate students with the help of modern teaching aids.
8. Assess the students' knowledge and skills in the subject of Forensic Medicine
9. Oriented to research methodology and conduct of research in the subject



SYLLABUS

Course contents:

I. General Principles of Forensic Medicine and Toxicology

- i. Identify the role of anatomy, physiology, biochemistry, microbiology, pathology, blood bank, psychiatry, radiology, forensic science laboratory as well as other disciplines of medical science to logically arrive at a conclusion in medico-legal autopsies and examination of medico-legal cases.
- ii. Describe the basic principles of techniques used in toxicological laboratory namely TLC, GLC, ASS, HPLC and Breath Alcohol Analyzer.
- iii. Execute the skills and knowledge expected at undergraduate level.

II. Basic Sciences and allied Subjects

A. Anatomy: Anatomy of parts and organs of the body which are important from the medico-legal aspect.

- i. Describe surface and regional anatomy of head, neck, chest and abdomen.
- ii. Describe gross anatomy and blood supply of heart, brain, lungs, spleen, liver and kidneys.
- iii. Describe gross anatomy of male and female genitalia.
- iv. Describe the comparative anatomy of male and female skeleton.
- v. Perform histological examination of various tissues.
- vi. Describe the development of foetus.

B. Physiology and Biochemistry: Mechanism of phenomena that are important in the body from the medico-legal viewpoint.

- i. Describe mechanism of fluid and electrolyte balance, thermoregulation in newborn and adults, endocrine functions.
- ii. Describe physiology of sexual behavior.
- iii. Describe physiological functioning of circulatory system, digestive system, respiratory system, haemopoietic system, central nervous system and reproductive system including pregnancy.

C. Pathology: Pathophysiology of vital processes and response mechanisms that modulate tissue and organ reaction to all forms of injury and have a bearing on antemortem and postmortem appearance in medico-legal cases, assessment of the duration of injuries and correlate trauma and disease.


- i. Describe pathology of inflammation and repair, immunity and hypersensitivity, Thrombosis and embolism, electric and ionizing radiation injuries, genetic factors in disease, deficiency disorders and malnutrition.



IV. Clinical Forensic Medicine

- i. Examine, assess legal implications and prepare report or certificate in cases of physical assault, suspected drunkenness, sexual offences, consummation of marriage and disputed paternity.
- ii. Collect, preserve and dispatch the specimen/material to the concerned authority and interpret the clinical and laboratory findings which are reported.
- iii. Examine injured person, prepare medico-legal report and initiate management.
- iv. Determine the age and establish identity of an individual for medico-legal purpose.
- v. Examine a person and assess disability in industrial accidents and diseases.
- vi. Perform examination and interpret findings for medico-legal purposes in cases pertaining to pregnancy, delivery, artificial insemination, abortion, sterilization, Impotence, AIDS and infectious disease.
- vii. Describe normal and abnormal sexual behavior and its medico-legal implications.
- viii. Examine and assess the medical fitness of a person for insurance, government service, sickness and fitness on recovery from illness.
- ix. Examine medico-legal problems related to clinical disciplines of medicine and allied subjects, Pediatrics, Surgery and allied subjects, ENT, Ophthalmology, Obstetrics and Gynecology, Dermatology and Anesthesiology.
- x. Examine medico-legal problems related to children, women and elderly.
- xi. Identify the cases of torture and violation of human rights and issues thereto

V. Forensic Pathology

- i. Apply the principles involved in methods of identification of human remains by race, age, sex, religion, complexion, stature, hair, teeth, anthropometry, dactylography, footprints, hairs, tattoos, poroscopy and superimposition techniques.
 - ii. Perform medico-legal postmortem and be able to exhume, collect, preserve and dispatch specimens or trace evidence to the appropriate authority.
 - iii. Diagnose and describe the pathology of wounds, mechanical and regional injuries, ballistics and wound ballistics, electrical injuries, lightning, neglect and starvation, thermal injuries, deaths associated with sexual offences, pregnancy, delivery, abortion, child abuse, dysbarism and barotraumas.
 - iv. Describe patho-physiology of shock and neurogenic shock.
 - v. Describe patho-physiology of asphyxia, classification, medico-legal aspects and postmortem findings of different types of asphyxial deaths.
 - vi. Diagnose and classify death, identify the signs of death, postmortem changes, interpret autopsy findings, artifacts and results of the other relevant investigations to logically conclude the cause, manner (suicidal, homicidal and accidental) and time of death.
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ii. Describe pathology of myocardial infarction, congenital heart diseases, tuberculosis of lungs, cirrhosis of liver, diseases of glomeruli and tubules and interstitial; tissues of Kidney, tumours, endocrine disorders, venereal diseases, spontaneous intracranial hemorrhages.

iii. Describe the pathology of sudden death.

iv. Describe local and systemic response to trauma and patho-physiology of shock.

v. Describe pathology of common infections and infestations of medico-legal significance.

D. Dentistry: Adequate knowledge of dentistry for solution of medico-legal problems like, injuries, age determination and identification

E. Radiology: Adequate knowledge of radiological procedures for solution of medico-legal problems.

F. Fundamentals of Forensic Medicine:

i. Describe the general forensic principle of ballistics, serology, analytical toxicology and photography.

ii. Interpret the scene of crime.

iii. Describe role of DNA profile and its application in medico-legal practice.

iv. Examine bloodstains for blood grouping, nuclear sexing, HLA typing, seminal stains and hair for medico-legal purpose.

v. Describe ethical aspects of Forensic Procedures including Narco-analysis, Brain mapping and Polygraph

III. Medical Ethics and Law (Medical Jurisprudence)

i. Describe the history of Forensic Medicine.

ii. Describe the legal and medico-legal system in India.

iii. Describe medical ethics and the law in relation to medical practice, declarations, oath, etiquette, Medical Council of India, disciplinary control, rights and duties of a registered medical practitioner's professional misconduct, consent, confidentiality, medical negligence (including all related issues) and Consumer Protection Act.

iv. Describe medical ethics and law in relation to organ transplantation, biomedical human research and experimentation, human rights, cloning, genetic engineering, human genome, citizen's charter and International codes of medical ethics.

v. Describe the ethics and law in relation to artificial insemination, abortion, antenatal sex, foetus, genetics and euthanasia.

vi. Interpret the ethics and law applicable to the human (clinical trials) and animal experimentation.

vii. Describe ethics in relation to elderly, women and children.

viii. Describe medical ethics and law in relation to nursing and other medical services/practices.

ix. Understanding about bio-ethics

- vii. Manage medico-legal responsibilities in mass disasters involving multiple deaths like fire, traffic accident, aircraft accident, rail accident and natural calamities.
- viii. Demonstrate postmortem findings in infant death and to differentiate amongst live birth, still birth and dead born.
- ix. Perform postmortem examination in cases of death in custody, torture and violation of human rights.
- x. Perform postmortem examination in cases of death due to alleged medical negligence as in operative and anesthetic deaths.

VI. Toxicology

- i. Describe the law relating to poisons, drugs, cosmetics, narcotic drugs and a. psychotropic substances.
- ii. Examine and diagnose poisoning cases and apply principles of general management and organ system approach for the management of poisoning cases.
- iii. Describe the basic principles of pharmacokinetics and pharmacodynamics of poisonous substances.
- iv. Describe the toxic hazards of occupation, industry, environment and the principles of predictive toxicology.
- v. Collect, preserve and dispatch material/s for analysis, interpret the laboratory findings and perform the Medico-legal formalities in a case of poisoning.
- vi. Demonstrate the methods of identification and analysis of common poisons
- vii. Describe the signs, symptoms, diagnosis and management of common acute and chronic poisoning due to:
 - a. Corrosives
 - b. Nonmetallic substances
 - c. Insecticides and weed killers
 - d. Metallic substances
 - e. Vegetable and organic irritants
 - f. Somniferous compounds
 - g. Inebriant substances
 - h. Deliriant substances
 - i. Food Contamination/adulteration.
 - j. Substances causing spinal and cardiac toxicity
 - k. Substances causing asphyxia (Asphyxiants)
 - l. Household toxins
 - m. Toxic envenomation

- n. Biological and chemical warfare
- o. Environmental intoxicants
- P. Occupational intoxicants

VII. Forensic Psychiatry

- i. Explain the common terminologies of forensic importance in Psychiatry.
- ii. Describe the medico-legal aspects of Psychiatry and mental health.
- iii. Describe medico-legal aspects of drug addiction.
- iv. Describe role of Psychiatry in criminal investigation, punishment and trial.
- v. Describe the civil and criminal responsibilities of a mentally ill person.
- vi. Describe the role of Psychology in criminal investigation, punishment and trial

TEACHING LEARNING METHODS

Teaching methodology

1. **Lectures:** Lectures are to be kept to a minimum. They may, however, be employed for teaching certain topics. Lectures may be didactic or integrated. The course shall be of three years, organized in six units (0-5). This modular pattern is a guideline for the department, to organize training. Training programme can be modified depending upon the work load and academic assignments of the department.
2. **Journal Club & Subject seminars:** Both are recommended to be held once a week. All the PG students are expected to attend and actively participate in discussion and enter in the Log Book relevant details. Further, every PG trainee must make a presentation from the allotted journal(s), selected articles and a total of 12 seminar presentations in three years. The presentations would be evaluated and would carry weightage for internal assessment.
3. **Case Presentations:** Minimum of 5 cases to be presented by every PG trainee each year. They should be assessed using check lists and entries made in the log book
4. **Clinico-Pathological correlation \ Conference:** Recommended once a month for all post graduate students. Presentation is to be done by rotation. If cases are not available, it could be supplemented by published CPCs.
5. **Inter-Departmental Meetings:** These meetings should be attended by post graduate students and relevant entries must be made in the Log Book.

6. **Teaching Skills:** The postgraduate students shall be required to participate in the teaching and training programme of undergraduate students and interns.
7. Undertake audit, use information technology tools and carry out research, both basic and clinical, with the aim of publishing his work and presenting his work at various scientific fora.
8. **Continuing Medical Education Programmes (CME):** At least two CME programmes should be attended by each student in 3 years.
9. **Conferences:** The student to attend courses, conferences and seminars relevant to the speciality.
10. A postgraduate student of a postgraduate degree course in broad specialities/super specialities would be required to present one poster presentation, to read one paper at a national/state conference and to present one research paper which should be published/accepted for publication/sent for publication during the period of his postgraduate studies so as to make him eligible to appear at the postgraduate degree examination.

INTERDISCIPLINARY TRAINING

Department of Forensic Medicine, student posted for training in the following clinical disciplines for a given period of time on rotational basis:

	Place of Posting	First year	Second Year	Third Year
01	Trauma & Emergency/Casualty/Emergency medicine department	1 Month	15 Days	15 Days
02	Radiology	7 Days	5 Days	3 Days
03	Psychiatry	5 Days	3 Days	2 Days
04	Forensic Science lab	7 Days	15 Days	Not required
05	Histopathology	7 Days	5 Days	3 Days

ASSESSMENT METHODS

FORMATIVE ASSESSMENT, ie., during the training

General Principles

Internal Assessment should be frequent, cover all domains of learning and used to provide feedback to improve learning; it should also cover professionalism and communication skills. The Internal Assessment should be conducted in theory and clinical examination.

Quarterly assessment during the MD training should be based on following educational activities:

1. Journal based / recent advances learning
2. Patient based /Laboratory or Skill based learning



3. Self-directed learning and teaching
4. Departmental and interdepartmental learning activity
5. External and Outreach Activities / CMEs

The student to be assessed periodically as per categories listed in postgraduate student appraisal form (Annexure I).

SUMMATIVE ASSESSMENT, ie., assessment at the end of training

The Postgraduate examination shall be in three parts:

The summative examination would be carried out as per the Rules given in POSTGRADUATE MEDICAL EDUCATION REGULATIONS, 2000.

The examination shall be in three parts:

1. **Thesis** Thesis shall be submitted at least six months before the Theory and Clinical / Practical examination. The thesis shall be examined by a minimum of three examiners; one internal and two external examiners, who shall not be the examiners for Theory and practical examination. A PG trainee shall be allowed to appear for the Theory and Practical/Clinical examination only after the acceptance of the Thesis by the examiners.
2. **Theory:** The examinations shall be organized on the basis of 'Grading' or 'Marking system' to evaluate and to certify PG trainee's level of knowledge, skill and competence at the end of the training. Obtaining a minimum of 50% marks in 'Theory' as well as 'Practical' separately shall be mandatory for passing examination as a whole. The examination for M.D. shall be held at the end of 3rd academic year. An academic term shall mean six month's training period.

There shall be four papers each of three hours duration. These are:

2. **Theory Examination:** There shall be four theory papers.

Paper I: Basic of Forensic Medicine, basic sciences and allied subjects.

Paper II: Clinical Forensic Medicine and medical jurisprudence.

Paper III: Forensic pathology and toxicology.

Paper IV: recent advances in Forensic Medicine, Forensic Psychiatry and Medical Toxicology, applied aspects of clinical disciplines and forensic sciences

3. **Practical Examination:**

Practical examination would be spread over two days and should be as follows:

Day 1

- o Clinical Cases - (any 4) Age estimation, injury report, examination of an insane person to evaluate criminal/civil responsibility, examination of an intoxicated person, examination of a suspected case of poisoning (acute/chronic), disputed paternity case and sexual offences (accused and victim).
- o Spots - (10) Histopathology slides, photographs, exhibit material, X-rays, mounted specimens, bones, poisons and weapons, charts etc.

- o Toxicology Exercises - (02) Identification and details of common poisons or chemical tests etc.
- o Laboratory Tests - (01) Identification of biological stains (Semen, Blood, Body fluids),
Histopathology slides of medico legal relevance, gram and acid fast staining etc.

Day 2

- o Postmortem Examination.
- o Thesis/Seminar Presentation - For assessment of research/teaching ability
- o Discussion on a case for expert opinion
- o Grand Viva Voce.

