

DPU

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Syllabus
for
PG Surgical Specialities

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ANAESTHESIOLOGY

(1) INTRODUCTION

Anaesthesiology as a specialty at present has evolved into widely encompassing areas of patient care with very rapid advances especially in last two decades. It has crossed the stifling boundaries and close confines of Operation theatre (OT). In addition to this primary area the Specialist Anaesthesiologist is playing multiple role viz: As an Intensivist in critical care, Pain specialist for acute, chronic pain, Resuscitation in casualty, ICU, and other sensitive areas. In addition his expert advice and services are needed in radiology for C.T, M.R.I, dark room procedures, cardiac catheterization laboratories, in psychiatry – Electro Convulsive Therapy (ECT), in Radiotherapy, for cobalt therapy, in Respiratory Therapy Units for sustenance of artificial ventilation and Ventilator Therapy. Even in operation theatre, because of advances in anaesthesia techniques, refinement in 'surgical techniques, availability of various potent drugs, monitoring devices and increased demand with opening of various surgical superspecialties, has enabled the consultant anaesthesiologist to have super specialized expertise in the peri-operative management.

In addition, with the advent of newly emerging field of Emergency Medicine, it has become imperative for the consultant Anaesthesiologist, to be up to date in this challenging field too. The Post Graduate training also has to be up to date in this challenging field too. The Post Graduate training also has to be inclusive of the areas of Emergency medicine.

Thus the modern day anaesthesiologist has to be expert to face varied challenges. Logically the training to be imparted to be post graduate students of Anaesthesiology has assumed considerable dimensions.

(2) GOALS

The most essential and primary aim is to generate competent, safe, expert, skillful & Caring consultant anaesthesiologist, intensivist and resuscitator.

The qualities to be absolutely necessary:

- 2.1 Sound theoretical knowledge, clinical expertise.
- 2.2 Excellent technological know-how in the field of Anaesthesiology.
- 2.3 Ability to provide safe, skillful, and appropriate technique or method Anaesthesia to his/her patients
- 2.4 To assist & if necessary train juniors
- 2.5 To perform meaningful, progressive and qualitative research in the field of Anaesthesiology
- 2.6 Ability and expertise to provide essential and valuable care to critically ill patients especially in resuscitation and ventilatory aspects
- 2.7 To keep up-to-date and well versed with all the recent advances in the specialties of anaesthesiology, critical care, emergency medicine and pain management
- 2.8 Last but not least :- to understand the bottom line not only the well being but the life of the patient is in their hands; so to adopt very caring and empathetic and conservative attitude toward all the patients under their care

(3) OBJECTIVES OF M.D. ANAESTHESIOLOGY

KNOWLEDGE & SKILLS

At the end of M.D. programme (36 months/ 6 terms) in Anaesthesiology, the students will have acquired the knowledge & understanding about:

- 3.1 Basic fundamentals about “Principle & Practices” of Anaesthesiology
- 3.2 Pre- operative evaluation, preparation of the patient for anaesthetic management of both elective and emergency surgical procedures.
- 3.3 Preparation of the anaesthetic equipments, anaesthesia machine, monitoring devices, Anaesthetic and other essential drugs, all the required resuscitation and emergency equipment.
- 3.4 Expertise in gaining vascular access, peripheral large veins and central venous access
- 3.5 Expertise in airway management, all the other invasive procedures of including anaesthesia.
- 3.6 Management smooth, safe and effective maintenance of Intra-operative Anaesthesia
- 3.7 Monitoring vigilantly, anticipating, preventing and treating common and uncommon side effects, toxicities and complications of anaesthesia.
- 3.8 Monitor, anticipate, prevent and treat all the problems associated with ongoing surgical procedure,
- 3.9 At the end of the surgical procedure-safely, smoothly and skillfully “recover” the patient back to as normal condition as possible.

- 3.10 Very essential Post-Operation management of the patients till they are discharged from post operation recovery room
- 3.11 Recod keeping- about pre operation evaluation/ medication, Intraoperative recording of vitals, all the anaesthetic events and the drugs used. Intravenous infusions, blood and other products used any and all noteworthy, specific surgery related events/ complication, registers, records, so as to keep themseleves and hospital medico legally safe
- 3.12 In addition to basic surgical like General Surgery, Orthopaedics, Obstetrics and Gynecology, E.N.T, and Ophthalmologu, the superspeciality surgical procedures like Neuro-Surgery, Paediatrics, plastic, urological, cardi thoracic, vascular etc
- 3.13 Preparation of research protocols conducting meaningful research and developing dissertation
- 3.14 Basic principles and techincal expertise in patient management of critically ill patients inI.C.U, Casualty, wards, in the form of cardio-pulmonary cerebral resuscitation, vetilation, monitoring, vascular and airway accesses and other invasive procedures.
- 3.15 Various aspects, procedures, methodologies of pain its management.
- 3.16 All the recent advances in the field of Anaesthesiology, critical care, pain and other related areas.
- 3.17 Theoretical knowledge about basic science like anatomy, physiology, pharmacology, pathology in relation with anesthesiology physical principles of gases, liquids, vapors, various instruments and general ideas about the statistical methods

3.18 Essential and very sensitive aspects of patient care involving ethics, medicolegal death comments and various related issues.

(4) INTEGRATION

The entire education as programme will be conducted in an integrated and co-ordinated manner in association with various pre and 'para-clinical departments' viz. Anatomy, Physiology, Biochemistry, Microbiology, Pathology, Pharmacology, Bio-statistics and Medical Jurisprudence. The senior staff member of these department will be requested to give lectures on various topic in relation with Anaesthesiology.

As a novel concept, the liaison with various outside institutes have been forged by the department for especially for the Super-specialty Anaesthesia training viz:for Cardiac Anaesthesia, with NM Wadia Institute of Cardiology and for Trauma and Orthopedic Anaesthesia, with Lokmanya Hospital, tie up has been in place. The PG residents have to rotate for one month during their 2nd year. In addition the surgical ICU is under the administrative and management control of the Department of Anaesthesiology and Critical care. So the day to day work of SICU has been integrated with department. Every month one 2nd year resident in collaboration with one each of General surgery, Orthopedics and Obstetrics and Gynecology resident have to perform daily rotational shift duty under the supervision and guidance of on duty lecturer and ultimate control of professor/Head of Anaesthesiology, who is the in-charge of surgical ICU.

(5) SYLLABUS

(5.1) HISTORY OF ANAESTHESIA AND ANALGESIA

- 5.1.1 Dark ages, Dawn of Analgesia
- 5.1.2 Laughing Gas and Horace wells.
- 5.1.3 "Oil of Vitriol" and W.T.G MORTON
- 5.1.4 Local Analgesia, Neuro-Muscular Blockers N M B,IVA
- 5.1.5 Boyle's/Anaesthesia Machine
- 5.1.6 Various other pioneers

(5.2) Basic sciences in Relation with Anaesthesiology

5.2.1 physiological sciences

(a) Physiology:-

- Respiratory system
- Pain pathway
- Cardiovascular system
- Central nervous system and peripheral nervous system
- Hepato-biliary system
- Renal physiology
- Autonomic nervous system
- Endocrine system
- Thermo regulation
- Aging and its physiological implications
- Physiology of pregnancy and process of labour

(b) Pharmacology:-

- General pharmacology
- Inhalational Anaesthetic agent
- Intravenous Anaesthetic Agents Local Analgesic Drugs
- Neuromuscular Junction and drugs acting on NMJ
- Drugs acting on Autonomic nervous system Analgesics
- Drugs acting upon Cardio-Vascular system
- Drugs acting upon Central Nervous system Diuretics
- Antibiotics/ Immuno-suppressants/ Miscellaneous Drugs
- Drug reactions and Inter-actions
- Miscellaneous drugs

5.2.2 Physical Sciences

(a) Anatomy

Clinical and Applied Anatomy of

- Respiratory system
- Cardiovascular system
- Nervous system
- Regional anatomy

- Vertebral column, lumbar and cervical vertebrae, sub arachnoid and epidural space. CSF production and circulation
- Nerves/Ganglia/plexuses
- Relevant to Anaesthesiologist
- Anatomical landmarks

(b) Biochemistry:

- Metabolism of body
- Acid base equili
- Arterial blood gas analysis
- Water, fluids and electrolytes metabolism
- Liver function/hemoglobin metabolism and Jaundice
- Renal function
- Hyper alimentation

(c) Pathology:

- Inflammation
- Pathology of liver diseases
- Pathology of renal diseases
- Cerebral hypoxemia and Cerebral oedema
- Diagnosis of brain death and its medicolegal implications
- Clinical pathology of Brain death

(d) Microbiology:

- Introduction of microbial environment
- Antibiotics prophylaxis and treatment
- Nosocomial infection
- Sterilization and fumigation of rooms, operation theatre and ICU
- Sterilization of equipment's
- Add nosocomial infections and prevention

(e) Physics

- Liquids/Vapors/Gases
- Gas Laws
- Anaesthesia Machine
- Inhalational agents-uptake and distribution

- Vaporizers
 - Anaesthetic breathing systems
 - Monitors and Monitoring
 - Additional various equipments
 - Ventilation and Ventilators
 - Ventury principle
 - Pulseoxymetry/Capnography
 - Pacemakers and Defibrillators
 - Electricity/electric fibers/explosion hazards
 - Modern anaesthesia work station.
 - Inhalation agents – uptake, distribution and elimination.
- Piped medical gases and vaccum (PMGV)

(f) Mathematics and Related Sciences:

- Biostatics
- Computers and their applications
- Tests of significance.
- Computers and their application in anaesthesia.

(5.3) Clinical sciences as applied to anaesthesiology: -

5.3.1 Anaesthesia procedures/methods/ techniques:

- (a) Pre-anaesthetic assessment, preparation and medication
- (b) Management of various anaesthetic methodologies
- (c) Principles and practice of general anaesthesia
- (d) Regional analgesia techniques nerve blocks and field blocks
- (e) Intravenous fluids management - crystalloids and colloids
- (f) Block, Blood componenets and plasma substitutes
- (g) Accidentsand Complications associated with Anaesthesia (Aetiology, Prevention and treatment)
- (h) Special techniques central venous line, CVP measurement, arterial line
- (i) Post operative care

- (j) Record keeping, quality assurance and self assessment audit in anaesthesia

5.3.2 Disease states / clinical problems and their management:

- (a) Pain and its management
- (b) Respiratory system diseases
- (c) Cardio-Vascular system diseases
- (d) Central Nervous System diseases
- (e) Hepatic diseases
- (f) Renal diseases
- (g) Metabolic Disorder
- (h) Obesity
- (i) Endocrine Diseases
- (j) Haemologic Disorder
- (k) Gastro-Intestinal Disorders
- (l) Gynaecological Diseases
- (m) Obstetric Problems
- (n) Cardio-Pulmonary-Cerebral Resuscitation

5.3.3 Super-speciality anaesthetic techniques:

- (a) Pediatrics Anaesthesia
- (b) Cardio-thoracic Anaesthesia
- (c) Neuro- Anaesthesia
- (d) Anaesthesia for Endoscopic Surgical Procedure
- (e) Anaesthesia for Plastic Surgery
- (f) Anaesthesia for Urological Procedures including renal transplant
- (g) Anaesthesia outside operation theatre and field Situations
- (h) Out Patient / Day outside operation theatre and field Care Anaesthesia
- (i) Anaesthesia for Ophthalmological Surgery
- (j) Anaesthesia for Laser Surgery
- (k) Dark Room Procedures and their Anaesthetic Management
- (l) Anaesthesia for Orthopedic and Traumatology

- (m) Anaesthesia requirement for Electro-Convulsive Therapy
- (n) Anaesthesia for Radiotherapy
- (o) Anaesthesia for liver Transplant
- (p) Anaesthesia for Surgical Oncological procedures and immunocompromised patient

5.3.4 Principles and practices of Emergency Medicine

5.3.5 Recent Advances in Anaesthesiology, Critical Care and Pain Management

5.3.6 Ethics and Medical legal Issues

(6) DISSERTATION

6.1 Introduction:-

Each Post-Graduate Student registered for M.D in Anaesthesiology, during the course of their training will have to conduct true, prospective, preferably comparative research and prepare then submit the thesis/ Dissertation as a partial but essential requirement for final examination.

6.2 Aim:

To Orient the students to various methodologies of research, induce them to get acquainted with them and facilitate fruitful research, which will add to existing body of knowledge in the fields of Anaesthesiology, Critical Care, Pain Management, Resuscitation & Monitoring.

6.3 Objectives:- To

- 6.3.1 identify a relevant research, questions
- 6.3.2 conduct critical review of literature
- 6.3.3 formulate a hypothesis
- 6.3.4 determine most suitable study design
- 6.3.5 state the objectives of the study
- 6.3.6 prepare a study protocol
- 6.3.7 get approval from the Ethics Committee

- 6.3.8 conduct the study, compile the data
- 6.3.9 analyze and interpret the data
- 6.3.10 draw a conclusions, declare results
- 6.3.11 write a research paper and get it published in indexed journal

(7) GUIDELINES:-

- 7.1 Student : Teacher Ratio of 1:1 must be strictly maintained
- 7.2 Scope of the study should be such that it is possible to conduct within the resources and time available
- 7.3 More emphasis should be given on methodology rather than results review of literature and biostatics.
- 7.4 Ethical issues and consideration must be given priority and all the concerned inclusive of entire department must be committed.
- 7.5 Within 6 months of Registration as a Post-Graduate student- Protocol/ Synopsis (approx. 200 words) consisting of
 - Title of study
 - Aims/Objectives
 - Material & methods
 - Adequate numbers of references (8-10) must be submitted.

It is to be signed by student, P.G. teacher, Head of the Department, Head Of the Institution. Penalty of Rs.100 or equivalent will be levied for late submission.

- 7.6 Candidate presenting for the M.D. Anaesthesiology final examinations shall be required to submit 6 months before commencement of the examination, this dissertation.
- 7.7 It should not exceed approximately 2500 words
- 7.8 Ideally / Preferably this should be written during 2nd & 3rd year of M.D. training course.

(8) EVALUATION

Introduction:-

The Doctor who has joined training programme of M.D. in Anaesthesiology must undergo evaluation intermittently at regular intervals. The evaluation has to be over all about the theoretical knowledge, practical examination, assessment of skills, techniques, proficiency in the procedures performed. This evaluation is an ongoing process.

(9) ASSESSMENT

9.1 Aims & objectives:-

- 9.1.1 Assessment of Theory practical at regular intervals as Internal Assessment is essential part of a training programme.
- 9.1.2 It is supposed to encompass all the aspects of the speciality must be impartial reliable and precise.

(10) PATTERN OF INTERNAL ASSESSMENT

For post-graduate degree / diploma programme in Anaesthesiology, the overall evaluation of the students will consist of preliminary examination and the university examination at the end of the course.

- 10.1 Within 3 months of Registration the students who have undergone Orientation, Introduction to the speciality will undergo the- primary orientation assessment examination. The aim of this examination will be to gauge the aptitude, grasping power and impact of the speciality on the candidate. There will not be any bearing of this test on the final examination.
- 10.2 The Preliminary Examination: - It will be conducted at the of 33rd month after the registration for M.D. By this time it is presumed that the entire syllabus pertaining to course has been completed.

10.3 Any candidate, whose performance in Preliminary Examination is for from satisfaction, may not be allowed to proceed to appear in Final Examination. The final decision in these matters will be at the discretion of Head of the Department.

10.4 Preliminary Examination
Preliminary examination shall be taken at the of 33 months & shall have

a) Four theory papers of 400 marks (100 marks each)
All the Paper (I,II,III and IV)will have following pattern
It will have two sectons each:
Section A:will have LAQs of 25 marks each.
(50 marks)
Section B:will have five SAQs of 10 marks each
(50 marks)

b) Practical 400marks
Long case (1) - 150 marks
Short cases(2) - 130 marks
Table viva (4 tables) - 120 marks
400 **marks**

(11) FINAL EXAMINATION (M.D. ANAESTHESIOLOGY)

11.1 The M.D. Final Examination will be conducted under two heads,

- 11.1.1 Theory
- 11.1.2 Practicals

11.2 Rules for Thesis/dissertation are as under that heading and are applicable as such.

11.2.1 Theory:

- (a) There shall be 4 papers, each of three hours duration carrying 100 marks each.
- (b) The pattern of theory papers will be the same as preliminary examination.

11.2.2 Practicals:

(a) Practical Examination will comprise of Total of 400 marks: under the following headings:

- i. Long Case:150 marks.
- ii. Short Cases:130 marks; (2 cases each of 65 marks.)
- iii. Table viva : marks under 4 subheadings- of 30 marks
Each- total 120 marks
 - Drugs
 - ECG/X-Rays/ ABG analyses/ Pulmonary function Tests
 - Instruments: Routine, standards, Resuscitation.
 - Equipments:-Anaesthesia machine, ventilators, Monitors etc

(12) NOMENCLATURE OF THEORY PAPERS:

- PaperI : Basic Sciences as applied to Anaesthesiology-
PaperII : Theory & Practice of Anaesthesia
Paper III : Clinical Disciplines as applied to Anaesthesiology, inclusive of Disease processes
Paper IV : Recent Advances & super specialities as applied to Anaesthesiology

(13) CONTENTS OF THEORY PAPERS

- 13.1 PAPER I : Basic Science as applied to Anaesthesiology- Anatomy , Physiology , Pharmacology , Microbiology, Pathology & Physics.
- 13.2 PAPER II : Theory & Practices of Anaesthesia including techniques, Procedures, Methodologies of Anaesthesia and their application in various Situations.

13.3 PAPER III : Medicine, Surgery & various clinical disciplines, inclusive of various Disease processes , pathological condition and other abnormalities as Applied to Anaesthesiology.

13.4 PAPER IV : Recent Advance & Super specialties as applied to ANaesthesiology, Critical care & pain Management.

(14) EXAMINERS

14.1 NUMBER OF EXAMINERS for MD and DA will be 4

Internal 2

External 2

14.2 Empananelling of examiners will be done by the Dr D.Y PATIL UNIVERSITY as Per the rules & regulation of the university.

(15) RECOMMENDED BOOKS

15.1 Text Books

15.1.1 Lee's Synopsis of Anaesthesia by Atkinson11thed.

15.1.2 Textbook of Anaesthesia by Aitkenhead, Rowbotham and Smith...4th Ed.

15.1.3 Wylie Churchill-Davidson's Textbook of Anaesthesia5th Ed.

15.1.4 Wylie Churchill-Davidson's Textbook of Anaesthesia6th Ed.

15.2 Reference Books

15.2.1 Anaesthesia by Ronald D.Miller5th Ed.

15.2.2 Clinical Anaesthesia by Stoelting ...3rd Ed.

15.2.3 Critical Care by Civetta, Taylor & Kirby3rd Ed.

15.2.4 Anaesthesia and Co-existing Diseases4th Ed.

15.2.5 Pain and It's Management by Ferrante3rd Ed.

15.2.6 Recent advances.

15.2.7 Year book of anaesthesia

15.2.8 CME books published at national / interational conferences.

15.3 Journals

- 15.3.1 Indian Journal of Anaesthesia
- 15.3.2 British Journal of Anaesthesia
- 15.3.3 Anaesthesiology
- 15.3.4 Journal of Anaesthesiology, Clinical
Pharmacology
- 15.3.5 Anaesthesia and Analgesia
- 15.3.6 Indian Journal of Critical Care