

Diploma in ANAESTHESIA (D.A.) - SYLLABUS

May - 2006

At the end of two years of training as residents in anaesthesia, the candidates should be fully conversant with theory and practical aspects of:

- A. Human Anatomy and Physiology** of various organ systems and cellular components in relation to Anaesthesia including muscles, neuromuscular junction, nerve plexuses, cardiovascular, respiratory, neurological, hepatobiliary, renal, endocrine and temperature homeostasis, theories of mechanism of production of anaesthesia, changes during pregnancy, various tests/investigations to evaluate the functional status of organ systems as applied to Anaesthesia Management, Intensive Care Practice and Pain Relief
- B. Pharmacology** as applied to Anaesthesia, Intensive Care Practice and Pain Relief including General Pharmacological Principles, Pharmacokinetics and Pharmacodynamics of Anaesthetic Drugs (including Uptake and Distribution of Inhaled Anaesthesia agents and All the Adjuncts used in Anaesthesia, Drugs used for treatment of various Diseases and Drug Interaction
- C. Pathophysiology of various diseases** including disorders of cardiovascular, respiratory, neurological, hepatobiliary, renal, endocrine and immune systems, various tests/investigations to grade/measure the disease process of various organ systems as applied to anaesthesia management, intensive care practice and pain relief
- D. Medicine** as applied to the practice of Anaesthesia including diagnosis and management of Diabetes, Hypertension, Bronchial Asthma, Chronic Obstructive Pulmonary Diseases, Respiratory Failure, ARDS, Myocardial Ischemia / Infarction, Arrhythmia, Shock, Congestive Heart Failure, Acute / Chronic Renal Failure, Head Injury, Unconscious patients, Status Epilepticus / Asthmaticus, Endocrine Disorders, Diseases related to Dysfunction of Hepatobiliary, Muscular, Connective Tissues and Immune system, Management of Perioperative Infection, Neuromuscular Disorders, Poisoning etc. and interpretation of ECG / Blood Gases / Other Biochemical Values and Function Tests
- E. Physics** as applied to Anaesthetic gases, vapours, anaesthesia machine, breathing systems, monitors, ventilators, therapeutic devices & other relevant equipment including physical principles involved in their construction and functioning
- F. Perioperative Anaesthesia management** including pre-operative evaluation, intra-operative management as well as post-operative care, monitoring (invasive as well as non-invasive) as applied to various surgical specialities and age groups.
- G. Theory and practice of various techniques / aspects of Routine & Emergency cases of General Anaesthesia** (e.g., Intravenous / Inhalational, Endotracheal / Mask / LMA / COPA, Spontaneous/Controlled mode of ventilation, induced hypotension / hypothermia etc.), **Regional Blocks** (Spinal, Epidural & Peripheral Nerve block) and **Local Anaesthesia**, including **various postures** required for anaesthetic/surgical procedures, their effects and **Recent Advances** for most minor to supra major surgeries in the field of:
 - **General surgery:** e.g. minor cases like haemorrhoidectomy to supra major cases like Liver transplant
 - **Gynaecology and Obstetrics**
 - **ENT and Head & Neck**
 - **Orthopaedics**
 - **Ophthalmology**
 - **Pediatric & Neonate:** Differences between adult and pediatric Anatomy, Physiology, Pharmacology, Anaesthesia principles, pediatric/neonatal emergencies, postoperative care, fluid & ventilator management etc

- **Cardiac, Vascular & Thoracic:** Conduct of closed heart as well as open heart surgeries (Valvular, Ischemic, Congenital -Cyanotic & Acyanotic), CABG (including off pump), Pulmonary Cases (Insertion of Double Lumen Tube, one lung anaesthesia), Thymus and Vascular surgeries etc. Ability to go on Cardiopulmonary bypass and disconnect from bypass, Ability to take, manage and interpret Arterial, Central Venous and P.A. Lines, postoperative care, management of re-explorations etc.
- **Neurosurgery:** Ability to monitor ICP, Management of head injuries, bleeds, tumours, etc with raised ICT. Ability to safely manage cases in sitting, prone, lateral, jack-knife positions and Anaesthetic management for neuro-radiology procedures
- **Urology:** Management of endoscopic surgeries like TURP/TURBT etc, Problems related to TURP, extracorporeal shock wave lithotripsy, percutaneous placement of nephrostomy etc., anaesthetic management of patients with acute and chronic renal failure, anaesthetic management of renal transplant cases of donor as well as recipient.
- **Plastic:** Management of burns contractures, congenital faciomaxillary abnormalities like cleft lip and palate, faciomaxillary injuries like fracture mandible, maxilla, zygoma, panfacial fractures, difficult intubations, microvascular surgeries, reconstructive surgeries, aesthetic surgeries etc
- **Dental:** Monitored Anaesthesia Care, Anaesthetic management of pedodontia patients, maxillo-facial surgeries including TMJ Ankylosis, Awake, Retrograde & Fiberoptic intubations
- **Endoscopies / laparoscopies:** Anaesthetic management, specific requirement and complications of various endoscopies like cystoscopy, ureteroscopy, PCNL, hysteroscopy, thoracoscopy, mediastinoscopy etc. and Lap. assisted/laparoscopic surgery like hysterectomy, tube ligation, appendicectomy, cholecystectomy etc.
- Anaesthesia for various **diagnostic, therapeutic and Specialized** procedures
- Anaesthesia for **Geriatric patients**
- Anaesthesia for surgery using **LASER**
- **Anaesthesia / Sedation techniques out side operating room:** Electroconvulsive shock therapy (ECT), Electrophysiologic tests, Radiofrequency ablation, Cardioversion, Cardiac catheterization, Special anaesthetic considerations in radiology and interventional radiology related to Dye allergies, Embolization, Monitoring / Equipment options in the MRI suite

H. History of Anaesthesia

- Airway Management:** Assessment of difficult airway, Awake, Retrograde, Use of intubating LMA's, Intubating Stylets, Various laryngoscopes designated for difficult airway, Insertion of Combitube, Ability to perform Cricothyrotomy and use of Venturi, Minitrach & Fiberoptic intubations etc
- Basic & Advanced Cardiopulmonary & Cerebral Resuscitation (CPCR)** for all age group of patients under different situations e.g., neonates, pregnant females, poisoning cases, trauma victims etc.
- Acid base & Fluid management** including use of Crystalloids, Colloids, blood & blood products
- Arterial, Central Venous and P.A. Lines:** Establishment, management and interpretation
- Anaesthetic drugs used in perioperative care**
- Equipments** (Minor to advanced monitoring) – their use, maintenance, sterilisation and care
- Medical gases: Knowledge of** Manufacturing, Storage and Central pipeline Systems
- Day Care / Outpatient Anaesthesia.**
- Remote Location Anaesthesia:** Anaesthetic practice during **disasters** and for large turnover surgeries in **camps / mass casualties.**

- R. Emergency Anaesthesia**
- S. Monitored Anaesthesia Care**
- T. Labour Analgesia**
- U. Pain relief – Acute & Chronic**
- V. Critical care practice** including oxygen therapy, respiratory therapy, ventilatory support, haemodynamic monitoring, prevention and management of multi organ failure, and care of patients with brain damage or brain dead patients For organ Transplant
- W. Advanced Trauma Life Support (ATLS)**
- X. Occupational Hazards**
- Y. Safety in Anaesthesia**
- Z. Complications of Anaesthetic procedures, its prevention, detection and management**
- AA. Record keeping in Anaesthesia**
- BB. Medical Audit**
- CC. Quality Assurance**
- DD. Anaesthesia standards:** e.g., Minimum monitoring standard
- EE. Medicolegal aspects in Anaesthesia**
- FF. Ethics in Anaesthesia**
- GG. Principles of Evidence Based Medicine**
- HH. Basic Research Methodology and Clinical Trials**
- II. Bio-statistics**
- JJ. Computers:** Utility, computer assisted learning and data storage, Computerised anaesthesia records
- KK. Skills:** for planning of operation theater, pain clinic, recovery room, intensive care etc. including selection and purchase of equipments

TRAINING PROGRAMME

A. ADMINISTRATION OF ANAESTHESIA & PERIOPERATIVE PATIENT CARE

I Year Residents:–

Assisting during minor & major anaesthesia procedures and managing patients in recovery or intensive care areas (all Under Supervision)

The first month of the first year will be spent in orientation in the operating rooms and attending lectures covering the basics of the discipline. After that the first year of training will be spent in learning the fundamentals of anesthesiology with emphasis on checking of anaesthesia equipment including anaesthesia machine, airway equipment and appropriate monitors, preparation of appropriate dosages of various drugs required at specific point of time, mastering clinical skills regarding selection and implementation of an appropriate anesthesia plan, placement of lines, induction of anaesthesia, intubation, maintenance of anaesthesia, and the successful reversal of anesthetic agents. Emphasis will also be placed on learning regional anaesthesia and Cardiopulmonary resuscitation.

To start with the first year residents will observe and then slowly become independent in giving general anaesthesia and Regional anaesthesia to patients belonging to ASA grade I & II for minor and major surgery, under graded supervision. They will be posted in rotation to the following specialties during the first year: Preoperative assessment area, General Surgery, Gynecology, Obstetrics, Orthopedic, ENT, and Recovery Room. They will be assigned to cases in the Operating Room at the hospitals attached to medical teaching institutes affiliated to the University under which they have registered and will gain experience under the direction and supervision of respective academic faculty.

II Year Residents:-

Assisting during minor & major procedures under anaesthesia, managing patients in recovery or intensive care areas and Independently conducting minor procedures under anaesthesia (GA/RA) for ASA grade I or II patients (excluding expected difficult airway cases and cases with expected major body fluid shift)

The second year of training will be devoted to the subspecialties/superspecialities of anesthesia at the hospitals affiliated to medical teaching institute and the university under the supervision of a faculty member with an aim to concentrate on mastering the knowledge and technical skills associated with providing anesthesia to subspecialty/superspeciality patients. Residents will be rotated in Pediatric anesthesia, Neuroanesthesia, Cardiovascular and Thoracic anesthesia, Ambulatory anesthesia, Obstetrics, Dental Surgery, Ophthalmology, Pain Clinic / Pain Management, Peripheral Theatres, Anaesthesia Outside Operating Rooms, Trauma care, Transplant Surgeries etc. They will be taught to give general anaesthesia and regional anesthesia (Extradural Block - EDB, Spinal Block, and Peripheral Nerve Blocks) to ASA grade I, II, III & IV patients under supervision for superspeciality theaters. They should be able to give GA/RA to other ASA grade I & II patients independently. Rotations in critical care areas e.g., Trauma Ward, Post Anesthesia Care Unit / ICU / Emergency Medical Service will also be part of the second year training curriculum. They should learn pediatric and trauma life support and maintain skills for basic and advanced cardiac life support. The student should be able to analyze and present scientific data.

B. ACADEMIC ACTIVITIES – Participation by way of attendance / presentation in Didactic lectures, Symposia, Seminars, Group discussions, Workshops, Morbidity & Mortality meet, Panel Discussion etc. **Each Student should have actively participated in at least 6 academic sessions per year** during the total training period of two years (total 12).

C. LOG BOOK MAINTENANCE of all the clinical and academic work done by the student in his/her tenure of three years.

Minimum Procedures/Cases required to be done and entered in the log book

Regional Block	
Spinal	= 20 to do
Epidural	= 20 to do
Combined Spinal Epidural	= 15 to do
Caudal	= 5 to do
Bier Block (IVRA)	= 3 to do
Sciatic/Femoral	= 3 + 3 (to observe or do)
Ankle Block	= 3 (to observe or do)
Stellate Ganglion Block	= 2 (to observe or do)
Brachial Plexus	= 5 to observe & 10 to do
Sympathetic Block	= 2 (to observe or do)
Trigger Point injection	= 2 (observe)
Other peripheral N. Block	= 2 to do
Ophthalmic Blocks	= 2 (to observe)
Field Block	= 2 (to observe or to do)
Anaesthesia for:	
General Surgery	= 30 (to do)
Gynecology	= 30 (to do)
Obstetrics	= 15 (to do)
ENT	= 15 (to do)
Orthopedics	= 15 (to do)

Ophthalmology	= 3 (to do)
Plastic Surgery	= 3 (to do)
Endoscopy / Laparoscopy	= 3 (to do)
Urology	= 3 (to do)
Open Heart	= 3 (to observe)
Closed Heart	= 3 (to observe)
Pediatric Surgery	= 3 (to observe)
Craniotomy	= 3 (to observe)
Spinal Surgery	= 3 (to observe)
Joint Replacement	= 3 (to observe)
Anesthesia for organ transplant	= 3 (to observe - desirable)
ECT	= 10 (to do)
Radiology / CT Scan	= 5 (to do) Anaesthesia/sedation
Procedures	
Internal Jugular Cannulation	= 5 (to observe or do)
External Jugular Cannulation	= 5 to do
Subclavian Vein Cannulation	= 5 (to observe or do)
Peripheral Central Line	= 10 to do
Arterial Line Cannulation	= 7 to do
Endotracheal Intubation	= 150 to do
LMA insertion	= 20 to do
Difficult Airway Management	= 5 to do
Conduct of Cases	
ASA I	= 150 to do
ASA II	= 100 to do
ASA III	= 30 (to observe)
ASA IV	= 20 (to observe)
Labour Analgesia	= 5 (to observe or do)

ASSESSMENT

(As per Direction No. 01/2008 dtd. 26/05/2008)

Recommended Reading

I. Books

SN	Name	Authors / Editors	Year of publication	Last Edition	Publication House
1	Lee's Synopsis of Anaesthesia	G.B.Cashman, N.J.H Davies	2006	13 th	Butterworth-Heinemenn
2	Wylie & Churchill Davidson's – A practice of Anaesthesia	Thomas E. Healy Paul R. Knight	2003	7 th	Arnold
3	Anaesthesia	Miller Ronald D.	2005	6 th	Elsevier Churchill Livingstone
4	Yao and Artusio's Anesthesiology	Fun-Sun F.Yao	2003	5 th	Lippincott Williams & Wilkins
5	Anesthesia and Co-existing Disease	R. K. Stoelting S.F. Dierdorf	2002	4 th	Churchil Livingstone
6	Clinical Anaesthesiology	G.Edward Morgan	2005	4 th	McGraw-Hill
7	Understanding Anaesthesia Equipment	Jerry A. Dorsch	1999	4 th	Williams & Witkins
8	Wards Anaesthesia Equipments	Davey	2005	5 th	Baillirro Tindall
9	Anatomy for Anaesthetists	Harold Ellis	2005	8 th	Blackwell Publishing
10	Pharmacology & Physiology in Anaesthetic Practice	Robert K Stoelting		3 rd	Lippincott-Raven
11	Shnider and Livinson's Anesthesia for bstetrics	Hughes	2001	4 th	Lippincott Williams & Wilkins
12	Understanding Paediatric Anaesthesia	Jaccob	2006	4 th	Elsevier
13	Cardiac Anesthesia	Kaplan	2005	4 th	W. B. Saunders & Co.
14	Clinical Application of Mechanical Ventilation	David W. Chang	2001	2 nd	Delmar-Thomas Learning

II Journals

1. Indian Journal of Anaesthesia	5. Anaesthesia
2. Journal of Anaesthesiology and Clinical Pharmacology	6. British Journal of Anaesthesia
3. Indian Journal of Critical Care Medicine	7. Anesthesia & Analgesia
4. Anesthesiology Clinics of North America	8. Anesthesiology