

Faculty of Medicine



**JSS Academy of Higher Education & Research**

(Deemed to be University)

Accredited "A" Grade by NAAC

Sri Shivarathreshwara Nagar, Mysuru – 570 015

# Regulation & Syllabus

Post Graduate Degree & Diploma Programs

**ANESTHESIA 2016**

***MD/PG Dip***

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## **MD ANESTHESIA**

**2016**



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**REGULATION AND SYLLABUS FOR  
POST GRADUATE DEGREE PROGRAMS 2016**

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**MD & DIPLOMA  
ANAESTHESIOLOGY**

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## CHAPTER I

### REGULATION FOR POST GRADUATE DEGREE AND DIPLOMA COURSES

#### 1. Branch of study

##### Post graduate degree courses

###### Doctor of Medicine

- a) Anaesthesiology
- b) Anatomy
- c) Biochemistry
- d) Community medicine
- e) Dermatology, venereology and leprosy
- f) Emergency medicine
- g) Forensic medicine
- h) General medicine
- i) Hospital administration
- j) Microbiology
- k) Pathology
- l) Paediatrics
- m) Pharmacology
- n) Physiology
- o) Psychiatry
- p) Tuberculosis and Respiratory Medicine
- q) Radio Diagnosis

###### Master of Surgery

- a) General surgery
- b) Obstetrics and gynaecology
- c) Ophthalmology
- d) Orthopaedics
- e) Otorhinolaryngology

###### Post graduate diploma courses

- a) Anaesthesiology (DA)
- b) Child Health (DCH)
- c) Clinical Pathology (DCP)
- d) Dermatology, Venereology & Leprosy (DDVL)
- e) Medical Radio Diagnosis (DMRD)
- f) Obstetrics & Gynaecology (DGO)
- g) Ophthalmology (DO)
- h) Orthopaedics (D Ortho)
- i) Otolaryngology (DLO)
- j) Psychiatric Medicine (DPM)

## **2. Eligibility for admission**

**MD / MS Degree and Diploma courses:** A candidate who has passed final year MBBS examination after pursuing a study in a medical college recognized by the Medical Council of India and has completed one year compulsory rotating internship in a teaching institution or other institution recognized by the Medical Council of India, and has obtained permanent registration of any State Medical Council, shall be eligible for admission.

## **3. Admission**

A candidate desirous of admission to Post Graduate Medical Programmes MD/MS / PG Diploma Courses is required to complete the application form and submit to the Deemed to be University along with prescribed documents on or before the scheduled date. Eligibility criteria, application form and details of documents to be submitted are available in the Deemed to be University website: [www.jssuni.edu.in](http://www.jssuni.edu.in).

## **4. Registration**

A candidate who has been admitted to postgraduate course shall register in the Deemed to be University within a month of admission after paying the registration fee.

## **5. Intake of students**

The intake of students to each course shall be in accordance with the MCI.

## **6. Duration of study**

**MD, MS Degree Courses:** The course of study shall be 3 completed years including the period of examination.

Provided that in case of students having a recognized 2 years postgraduate diploma course in the same subject, the period of training including the period of examination shall be 2 years.

**Diploma courses:** The course of study shall be 2 completed years including the examination period.

## **7. Methodology of training**

The training of postgraduate for degree/diploma shall be residency pattern, with graded responsibilities in the management and treatment of patients entrusted to his/her care. The participation of the students in all facets of educational process is essential. Every candidate should take part in seminars, group discussions, grand rounds, case demonstration, clinics, journal review meetings, CPC and clinical meetings. Every candidate shall participate in the teaching and training programme of undergraduate students. Training should include involvement in laboratory and experimental work, and research studies. Basic medical sciences students should be posted to allied and relevant clinical departments or institutions. Similarly, clinical subjects' students should be posted to basic medical sciences and allied specialty departments or institutions.

## **8. Attendance, progress and conduct**

A candidate pursuing degree/diploma course, shall work in the concerned department of the institution for the full period as full time student. No candidate is permitted to run a clinic/laboratory/nursing home while studying postgraduate course, nor can he/she work in a nursing home or other hospitals/

clinic/laboratory while studying postgraduate course.

Each year shall be taken as a unit for the purpose of calculating attendance.

Every student shall attend symposia, seminars, conferences, journal review meetings, grand rounds, CPC, case presentation, clinics and lectures during each year as prescribed by the department and not absent himself / herself from work without valid reasons.

Every candidate is required to attend a minimum of 80% of the training during each academic year of the post graduate course. Provided, further, leave of any kind shall not be counted as part of academic term without prejudice to minimum 80% attendance of training period every year.

Any student who fails to complete the course in the manner stated above shall not be permitted to appear for the Deemed to be University Examinations.

## 9. Monitoring progress of study

**Work diary / Log Book:** Every candidate shall maintain a work diary and record his/her participation in the training programmes conducted by the department such as journal reviews, seminars, etc. Special mention shall be made of the presentations by the candidate as well as details of clinical or laboratory procedures, if any, conducted by the candidate. The work diary shall be scrutinized and certified by the Head of the Department and Head of the Institution, and presented in the Deemed to be University practical/clinical examination.

**Periodic tests:** In case of degree courses of three years duration (MD/MS), the concerned departments shall conduct three tests, two of them be annual tests, one at the end of first year and the other at the end of the second year. The third test shall be held three months before the final examination. The tests shall include written papers, practical / clinical and viva voce. Records and marks obtained in such tests shall be maintained by the Head of the Department and sent to the Deemed to be University, when called for.

In case of diploma courses of two years duration, the concerned departments shall conduct two tests, one of them at the end of first year and the other in the second year, three months before the final examination. The tests shall include written papers, practical / clinical and viva voce.

**Records:** Records and marks obtained in tests shall be maintained by the Head of the Department and shall be made available to the Deemed to be University or MCI.

## 10. Dissertation

Every candidate pursuing MD/MS degree course is required to carry out work on a selected research project under the guidance of a recognised post graduate teacher. The results of such a work shall be submitted in the form of a dissertation.

The dissertation is aimed to train a postgraduate student in research methods and techniques. It includes identification of a problem, formulation of a hypothesis, search and review of literature, getting acquainted with recent advances, designing of a research study, collection of data, critical analysis, and comparison of results and drawing conclusions.

Every candidate shall submit to the Controller of Examinations of the Deemed to be University in the prescribed proforma, a synopsis containing particulars of proposed dissertation work within six months from the date of commencement of the course, on or before the dates notified by the Deemed to be University. The synopsis shall be sent through proper channel.

Such synopsis will be reviewed and the dissertation topic will be registered by the Deemed to be University. No change in the dissertation topic or guide shall be made without prior approval of the Deemed to be University.

The dissertation should be written under the following headings:

- a) Introduction
- b) Aims or Objectives of study
- c) Review of Literature
- d) Material and Methods
- e) Results
- f) Discussion
- g) Conclusion
- h) Summary
- i) References
- j) Tables
- k) Annexure
- l) Proof of Paper presentation and publication

The written text of dissertation shall be not less than 50 pages and shall not exceed 150 pages excluding references, tables, questionnaires and other annexure. It should be neatly typed in double line spacing on one side of paper (A4 size, 8.27" x 11.69") and bound properly. Spiral binding should be avoided. The dissertation shall be certified by the guide, head of the department and head of the Institution.

Four copies of dissertation thus prepared shall be submitted to the Controller of Examinations, six months before final examination, on or before the dates notified by the Deemed to be University.

The dissertation shall be valued by examiners appointed by the Deemed to be University. Approval of dissertation work is an essential precondition for a candidate to appear in the Deemed to be University examination.

Guide: The academic qualification and teaching experience required for recognition as a guide for dissertation work is as per MCI Minimum Qualifications for Teachers in Postgraduate Medical Education Regulations, 2000. Teachers in a medical college/institution having a total of eight years teaching experience out of which at least five years teaching experience as Assistant Professor gained after obtaining post graduate degree shall be recognised as post graduate teachers.

Co Guide: A Co-guide may be included provided the work requires substantial contribution from a sister department or from another medical institution recognised for teaching/training by JSS Deemed to be University / Medical Council of India.

Change of guide: In the event of a registered guide leaving the college for any reason or in the event of death of guide, guide may be changed with prior permission from the Deemed to be University.

A postgraduate student is 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.

## 11. Schedule of examination

The examination for MD / MS courses shall be held at the end of three academic years (six academic terms). The examination for the diploma courses shall be held at the end of two academic years.

For students who have already passed Post Graduate Diploma and appearing for MD examination, the examination shall be conducted after two academic years including submission of dissertation. The Deemed to be University shall conduct two examinations in a year at an interval of four to six months between the two examinations. Not more than two examinations shall be conducted in an academic year.

## 12. Scheme of examination

### MD/MS

**Dissertation:** Every candidate shall carry out work and submit a dissertation as indicated in Sl. No. 10. Acceptance of dissertation shall be a precondition for the candidate to appear for the final examination.

**Written Examination (Theory):** A written examination shall consist of four question papers, each of three hours duration. Each paper shall carry 100 marks. Out of the four papers, the 1st paper in clinical subjects will be on applied aspects of basic medical sciences. Recent advances may be asked in any or all the papers. In basic medical subjects and para-clinical subjects, questions on applied clinical aspects shall also be asked.

### Pattern of Theory Examination Question Paper:

Each paper shall consist of two long essay questions each carrying 20 marks, 3 short essay questions each carrying 10 marks and 6 short answer questions each carrying 5 marks. Total marks for each paper shall be 100.

**Practical/Clinical Examination:** In case of Practical examination for the subjects in Basic Medical Sciences Practical Examination shall be conducted to test the knowledge and competence of the candidates for making valid and relevant observations based on the experimental/Laboratory studies and his ability to perform such studies as are relevant to his subject.

Clinical examination for the subjects in Clinical Sciences shall be conducted to test the knowledge and competence of the candidates for undertaking independent work as a specialist/Teacher, for which candidates shall examine a minimum one long case and two short cases.

The total marks for Practical / clinical examination shall be 200.

**Viva Voce:** Viva Voce shall be thorough and shall aim at assessing the candidate knowledge and competence about the subject, investigative procedures, therapeutic technique and other aspects of the speciality, which form a part of the examination.

The total marks shall be 100 and the distribution of marks shall be as under:

- |     |   |    |
|-----|---|----|
| i)  | For examination of all components of syllabus | 80 |
| ii) | For Pedagogy                                  | 20 |

If there is skills evaluation, 10 marks shall be reserved for Pedagogy and 10 marks for skill evaluation.

**Examiners.** There shall be at least four examiners in each subject. Out of



them, two shall be external examiners and two shall be internal examiners. The qualification and teaching experience for appointment as an examiner shall be as laid down by the Medical Council of India.

**Criteria for declaring as pass in Deemed to be University Examination:**

A candidate shall pass theory and practical including clinical and viva-voce examination separately and shall obtain 40% marks in each theory paper and not less than 50% marks cumulatively in all the four papers for post graduate degree examination to be declared as pass.

A candidate obtaining less than 40% marks in any paper and obtaining less than 50% of marks cumulatively in all the four papers for postgraduate degree examination shall be declared to have failed in the examination. Failed candidate may appear in any subsequent examination upon payment of fresh fee to the Controller of Examinations.

**Declaration of class:** A successful candidate passing the Deemed to be University examination in first attempt and secures grand total aggregate 75% of marks or more will be declared to have passed the examination with distinction, 65% but below 75% declared as First Class and 50% but below 65% declared as Second Class.

A candidate passing the Deemed to be University examination in more than one attempt shall be declared as Pass Class irrespective of the percentage of marks.

## **Post Graduate Diploma Examinations**

Diploma examination in any subject shall consist of theory (written papers), Practical / Clinical and Viva - Voce.

**Theory:** There shall be three written question papers each carrying 100 marks. Each paper will be of three hours duration. In clinical subjects one paper out of this shall be on basic medical sciences. In basic medical subjects and Para-clinical subjects, questions on applied clinical aspects shall also be asked.

**Pattern of Theory Examination Question Paper:**

Each paper shall consist of two long essay questions each carrying 20 marks, 3 short essay questions each carrying 10 marks and 6 short answer questions each carrying 5 marks. Total marks for each paper shall be 100.

**Practical Clinical Examination:** In case of practical examination it shall be aimed at assessing competence, skills related to laboratory procedures as well as testing students ability to make relevant and valid observations, interpretation of laboratory or experimental work relevant to his/her subject.

In case of clinical examination, it shall aim at examining clinical skills and competence of candidates for undertaking independent work as a specialist. Each candidate shall examine at least one long case and two short cases.

The maximum marks for Practical / Clinical shall be 150.

**Viva Voce Examination:** Viva Voce examination shall be thorough and shall aim at assessing the candidate's knowledge and competence about the subject, investigative procedures, therapeutic technique and other aspects of the speciality, which shall form a part of the examination. The total marks shall be 50.

**Examiners.** There shall be at least four examiners in each subject. Out of

them, two shall be external examiners and two shall be internal examiners. The qualification and teaching experience for appointment as an examiner shall be as laid down by the Medical Council of India.

**Criteria for declaring as pass in Deemed to be University Examination:**

A candidate shall pass theory and practical including clinical and viva-voce examination separately and shall obtain 40% marks in each theory paper and not less than 50% marks cumulatively in all the three papers for post graduate diploma examination to be declared as pass.

A candidate obtaining less than 40% marks in any paper and obtaining less than 50% of marks cumulatively in all the three papers for post graduate diploma examination shall be declared to have failed in the examination. Failed candidate may appear in any subsequent examination upon payment of fresh fee to the Controller of Examinations.

**Declaration of class:** A successful candidate passing the Deemed to be University examination in first attempt and secures grand total aggregate 75% of marks or more will be declared to have passed the examination with distinction, 65% but below 75% declared as First Class and 50% but below 65% declared as Second Class.

A candidate passing the Deemed to be University examination in more than one attempt shall be declared as Pass Class irrespective of the percentage of marks.

**13. Number of candidates per day**

The maximum number of candidates to be examined in Clinical/ practical and Oral on any day shall not exceed eight for M.D./M.S. degree, eight for diploma.

## **CHAPTER II**

### **GOALS AND GENERAL OBJECTIVES OF POSTGRADUATE MEDICAL EDUCATION PROGRAM**

#### **GOAL**

The goal of postgraduate medical education shall be to produce competent specialists and/or medical teachers:

1. Who shall recognize the health needs of the community and carry out professional obligations ethically and in keeping with the objectives of the national health policy.
2. Who shall have mastered most of the competencies, pertaining to the specialty, that are required to be practiced at the secondary and the tertiary levels of the health care delivery system.
3. Who shall be aware of the contemporary advance and developments in the discipline concerned.
4. Who shall have acquired a spirit of scientific inquiry and is oriented to the principles of research methodology and epidemiology and
5. Who shall have acquired the basic skills in teaching of the medical and paramedical professionals.

#### **GENERAL OBJECTIVES**

At the end of the postgraduate training in the discipline concerned the student shall be able to:

1. Recognize the importance to the concerned speciality in the context of the health needs of the community and the national priorities in the health section.
2. Practice the specialist concerned ethically and in step with the principles of primary health care.
3. Demonstrate sufficient understanding of the basic sciences relevant to the concerned specialty.
4. Identify social, economic, environmental, biological and emotional determinants of health in a given case, and take them into account while planning therapeutic, rehabilitative, preventive and primitive measure/strategies.
5. Diagnose and manage majority of the conditions in the speciality concerned on the basis of clinical assessment, and appropriately selected and conducted investigations.
6. Plan and advice measures for the prevention and rehabilitation of patients suffering from disease and disability related to the specialty.
7. Demonstrate skills in documentation of individual case details as well as morbidity and mortality rate relevant to the assigned situation.
8. Demonstrate empathy and humane approach towards patients and their families and exhibit interpersonal behavior in accordance with the societal norms and expectations.
9. Play the assigned role in the implementation of national health programme, effectively and responsibly.

10. Organize and supervise the chosen/assigned health care services demonstrating adequate managerial skills in the clinic/hospital or the field situation.
11. Develop skills as a self-directed learner, recognize continuing education needs; select and use appropriate learning resources.
12. Demonstrate competence in basic concepts of research methodology and epidemiology, and be able to critically analyze relevant published research literature.
13. Develop skills in using educational methods and techniques as applicable to the teaching of medical/nursing students, general physicians and paramedical health workers.
14. Function as an effective leader of a health team engaged in health care, research or training.

**STATEMENT OF THE COMPETENCIES:** Keeping in view the general objectives of postgraduate training, each discipline shall aim at development of specific competencies which shall be defined and spelt out in clear terms. Each department shall produce a statement and bring it to the notice of the trainees in the beginning of the programme so that he or she can direct the efforts towards the attainment of these competencies.

**COMPONENTS OF THE POSTGRADUATE CURRICULUM:**

The major components of the Postgraduate curriculum shall be:

- Theoretical knowledge
- Practical and clinical skills
- Dissertation skills.
- Attitudes including communication skills.
- Training in Research Methodology, Medical Ethics and Medicolegal aspects.

(Source: Medical Council of India, Regulations on Postgraduate Medical Education, 2000)

## CHAPTER III

### Monitoring Learning Progress

It is essential to monitor the learning progress of each candidate through continuous appraisal and regular assessment. It not only helps teachers to evaluate students, but also students to evaluate themselves. The monitoring shall be done by the staff of the department based on participation of students in various teaching / learning activities. It may be structured and assessment be done using checklists that assess various aspects. Model checklists are given in this chapter which may be copied and used.

The learning outcomes to be assessed should include:

1. Personal Attitudes.
2. Acquisition of Knowledge.
3. Clinical and operative skills and
4. Teaching skills.

**1. Personal Attitudes:** The essential items are:

- a) Caring attitude.
- b) Initiative.
- c) Organisational ability.
- d) Potential to cope with stressful situations and undertake responsibility.
- e) Trustworthiness and reliability.
- f) To understand and communicate intelligibly with patients and others.
- g) To behave in a manner that establishes professional relationships with patients and colleagues.
- h) Ability to work in a team.
- i) A critical enquiring approach to the acquisition of knowledge.

The methods used mainly consist of observation. It is appreciated that these items require a degree of subjective assessment by the guide, supervisors and peers.

**2. Acquisition of Knowledge:** The methods used comprise of 'Log Book' which records participation in various teaching / learning activities by the students. The number of activities attended and the number in which presentations are made are to be recorded. The log book should periodically be validated by the supervisors. Some of the activities are listed. The list is not complete. Institutions may include additional activities, if so, desired.

- a) **Journal Review Meeting (Journal Club).** The ability to do literature search, in depth study, presentation skills, and use of audio- visual aids are to be assessed. The assessment is made by faculty members and peers attending the meeting using a checklist (see Model Checklist – I, Chapter III)
- b) **Seminars / Symposia.** The topics should be assigned to the student well in advance to facilitate in depth study. The ability to do literature search, in depth study, presentation skills and use of audio- visual aids are to be assessed using a checklist (see Model Checklist-II, Chapter III)

- c) **Clinico-pathological conferences.** This should be a multidisciplinary study of an interesting case to train the candidate to solve diagnostic and therapeutic problems by using an analytical approach. The presenter(s) are to be assessed using a check list similar to that used for seminar.
- d) **Medical Audit.** Periodic morbidity and mortality meeting shall be held. Attendance and participation in these must be insisted upon. This may not be included in assessment.

### 3. Clinical skills:

- a. **Day to Day work:** Skills in outpatient and ward work should be assessed periodically. The assessment should include the candidates' sincerity and punctuality, analytical ability and communication skills (see Model Checklist III, Chapter III).
  - b. **Clinical meetings:** Candidates should periodically present cases to his peers and faculty members. This should be assessed using a check list (see Model checklist IV, Chapter III).
  - c. **Clinical and Procedural skills:** The candidate should be given graded responsibility to enable learning by apprenticeship. The performance is assessed by the guide by direct observation. Particulars are recorded by the student in the log book. (Table No.3, Chapter III).
4. **Teaching skills:** Candidates should be encouraged to teach undergraduate medical students and paramedical students, if any. This performance should be based on assessment by the faculty members of the department and from feedback from the undergraduate students (See Model checklist V, Chapter III).
  5. **Periodic tests:** In case of degree courses of three years duration, the department may conduct three tests, two of them be annual tests, one at the end of first year and the other in the second year. The third test may be held three months before the final examination. In case of diploma courses of two year duration, the departments may conduct two tests. One of them at the end of first year and the other in the second year, three months before the final examination. The tests may include written papers, practical / clinical and viva voce.
  6. **Work diary:** Every candidate shall maintain a work diary and record his/her participation in the training programmes conducted by the department such as journal reviews, seminars, etc. Special mention may be made of the presentations by the candidate as well as details of clinical or laboratory procedures, if any conducted by the candidate.
  7. **Records:** Records, log books and marks obtained in tests will be maintained by the Head of the Department and will be made available to the Deemed to be University or MCI.
  8. **Log book:** The log book is a record of the important activities of the candidates during his training. Internal assessment should be based on the evaluation of the log book. Collectively, log books are a tool for the evaluation of the training programme of the institution by external agencies. The record includes academic activities as well as the presentations and procedures carried out by the candidate. Format for the log book for the different activities is given in Tables 1, 2 and 3 of Chapter III. Copies may be made and used by the institutions.

**Procedure for defaulters:** Every department should have a committee to review such situations. The defaulting candidate is counseled by the guide and head of the department. In extreme cases of default the departmental committee may recommend that defaulting candidate be withheld from appearing the examination, if she/he fails to fulfill the requirements in spite of being given adequate chances to set him or herself right.

### Format of Model Check Lists

#### Check List-I

#### MODEL CHECK-LIST FOR EVALUATION OF JOURNAL REVIEW PRESENTATIONS

**Name of the Student:**

**Name of the Faculty/Observer:**

**Date:**

Sl No	Items for observation during presentation	Poor 0	Below Average 1	Average 2	Good 3	Very Good 4
1.	Article chosen was					
2.	Extent of understanding of scope & objectives of the paper by the candidate					
3.	Whether cross references have been consulted					
4.	Whether other relevant publications consulted					
5.	Ability to respond to questions on the paper / subject					
6.	Audio-visual aids used					
7.	Ability to defend the paper					
8.	Clarity of presentation					
9.	Any other observation					
	<b>Total Score</b>					

## Check List – II

### MODEL CHECK-LIST FOR EVALUATION OF SEMINAR PRESENTATIONS

**Name of the Student:**

**Name of the Faculty/Observer:**

**Date:**

<b>Sl No</b>	<b>Items for observation during presentation</b>	<b>Poor 0</b>	<b>Below Average 1</b>	<b>Average 2</b>	<b>Good 3</b>	<b>Very Good 4</b>
1.	Whether other relevant publications consulted					
2.	Whether cross references have been consulted					
3.	Completeness of Preparation					
4.	Clarity of Presentation					
5.	Understanding of subject					
6.	Ability to answer questions					
7.	Time scheduling					
8.	Appropriate use of Audio-Visual aids					
9.	Overall Performance					
10.	Any other observation					
	<b>Total Score</b>					



### Check List - III

#### MODEL CHECK LIST FOR EVALUATION OF CLINICAL WORK IN WARD / OPD

(To be completed once a month by respective Unit Heads,  
including posting in other departments)

**Name of the Student:**

**Name of the Faculty/Observer:**

**Date:**

SI No	Points to be considered	Poor 0	Below Average 1	Average 2	Good 3	Very Good 4
1.	Regularity of attendance					
2.	Punctuality					
3.	Interaction with colleagues and supportive staff					
4.	Maintenance of case records					
5.	Presentation of cases during rounds					
6.	Investigations work up					
7.	Beside manners					
8.	Rapport with patients					
9.	Counseling patient's relatives for blood donation or Postmortem and Case follow up.					
10.	Overall quality of ward work					
	<b>Total Score</b>					

**Check List - IV**  
**EVALUATION FORM FOR CLINICAL PRESENTATION**

**Name of the Student:**

**Name of the Faculty:**

**Date:**

<b>Sl No</b>	<b>Points to be considered</b>	<b>Poor 0</b>	<b>Below Average 1</b>	<b>Average 2</b>	<b>Good 3</b>	<b>Very Good 4</b>
1.	Completeness of history					
2.	Whether all relevant points elicited					
3.	Clarity of Presentation					
4.	Logical order					
5.	Mentioned all positive and negative points of importance					
6.	Accuracy of general physical examination					
7.	Whether all physical signs elicited correctly					
8.	Whether any major signs missed or misinterpreted					
9.	Diagnosis: Whether it follows logically from history and findings					
10.	Investigations required <ul style="list-style-type: none"> <li>• Complete list</li> <li>• Relevant order</li> <li>• Interpretation of investigations</li> </ul>					
11.	Ability to react to questioning Whether it follows logically from history and findings					
12.	Ability to defend diagnosis					
13.	Ability to justify differential diagnosis					
14.	Others					
	<b>Total Score</b>					

## Check List - V

### MODEL CHECK LIST FOR EVALUATION OF TEACHING SKILL PRACTICE

SI No		Strong Point	Weak Point
1.	Communication of the purpose of the talk		
2.	Evokes audience interest in the subject		
3.	The introduction		
4.	The sequence of ideas		
5.	The use of practical examples and/or illustrations		
6.	Speaking style (enjoyable, monotonous, etc., specify)		
7.	Attempts audience participation		
8.	Summary of the main points at the end		
9.	Asks questions		
10.	Answers questions asked by the audience		
11.	Rapport of speaker with his audience		
12.	Effectiveness of the talk		
13.	Uses AV aids appropriately		

## Check List - VI

### MODEL CHECK LIST FOR DISSERTATION PRESENTATION

**Name of the Student:**

**Name of the Faculty:**

**Date:**

<b>SI No</b>	<b>Points to be considered</b> <b>divine</b>	<b>Poor</b> <b>0</b>	<b>Below</b> <b>Average</b> <b>1</b>	<b>Average</b> <b>2</b>	<b>Good</b> <b>3</b>	<b>Very</b> <b>Good</b> <b>4</b>
1.	Interest shown in selecting a topic					
2.	Appropriate review of literature					
3.	Discussion with guide & other faculty					
4.	Quality of Protocol					
5.	Preparation of proforma					
	<b>Total Score</b>					

## Check List - VII

### CONTINUOUS EVALUATION OF DISSERTATION WORK BY GUIDE / CO GUIDE

**Name of the Student:**

**Name of the Faculty:**

**Date:**

<b>Sl No</b>	<b>Items for observation during presentations</b>	<b>Poor 0</b>	<b>Below Average 1</b>	<b>Average 2</b>	<b>Good 3</b>	<b>Very Good 4</b>
1.	Periodic consultation with guide/co-guide					
2.	Regular collection of case Material					
3.	Depth of analysis / discussion					
4.	Departmental presentation of findings					
5.	Quality of final output					
6.	Others					
	<b>Total Score</b>					





## LOG BOOK

**Table 3:** Diagnostic and Operative procedures performed

Name:

Admission year:

College:

<b>Date</b>	<b>Name</b>	<b>ID No.</b>	<b>Procedure</b>	<b>Category O, A, PA, PI*</b>

**\* Key:**

O - Washed up and observed

A - Assisted a more senior Surgeon

PA - Performed procedure under the direct supervision of a senior Surgeon  
PI - Performed independently



### Model Overall Assessment Sheet

SI No	Faculty Member & Others	Name of Student and Mean Score*																		
		A	B	C	D	E	F	G	H	I	J									
1.	<b>Journal Review Presentations</b>																			
2.	<b>Seminars</b>																			
3.	<b>Clinical work in wards</b>																			
4.	<b>Clinical presentation</b>																			
5.	<b>Teaching skill practice</b>																			
	<b>Total Score</b>																			

Note: Use separate sheet for each year.

**Signature of HOD**

**Signature of Principal**

The above overall assessment sheet used along with the logbook should form the basis for certifying satisfactory completion of course of study, in addition to the attendance requirement.

\* KEY:

**Mean score** : Is the sum of all the scores of checklists 1 to 7.  
**A, B, .....** Name of the trainees.

## Chapter IV

### Medical Ethics Sensitisation and Practice

#### Introduction

There is now a shift from the traditional individual patient- doctor relationship and medical care. With the advances in science and technology and the needs of patients, their families and the community, there is an increased concern with the health of society. There is a shift to greater accountability to the society. Doctors and health professionals are confronted with many ethical problems. It is, therefore necessary to be prepared to deal with these problems. To accomplish the Goal and General Objective stated in Chapter II and develop human values it is urged that ethical sensitisation be achieved by lectures or discussion on ethical issues, clinical discussion of cases with an important ethical component and by including ethical aspects in discussion in all case presentation, bedside rounds and academic postgraduate programmes.

#### Course Contents

##### 1. Introduction to Medical Ethics

- What is Ethics?
- What are values and norms?
- Relationship between being ethical and human fulfillment.
- How to form a value system in one's personal and professional life.
- Heteronomous Ethics and Autonomous Ethics.
- Freedom and personal Responsibility.

##### 2. Definition of Medical Ethics

- Difference between medical ethics and bio-ethics
- Major Principles of Medical Ethics
  - Beneficence = fraternity
  - Justice = equality
  - Self determination (autonomy) = liberty

##### 3. Perspective of Medical Ethics

- The Hippocratic Oath.
- The Declaration of Helsinki.
- The WHO Declaration of Geneva.
- International code of Medical Ethics. (1993)
- Medical Council of India Code of Ethics.

##### 4. Ethics of the Individual

- The patient as a person.
- The Right to be respected.
- Truth and Confidentiality.
- The autonomy of decision.
- The concept of disease, health and healing.
- The Right to health.
- Ethics of Behaviour modification.
- The Physician – Patient relationship.
- Organ donation.

##### 5. The Ethics of Human life

- What is human life?
- Criteria for distinguishing the human and the non-human.

- Reasons for respecting human life.
- The beginning of human life.
- Conception, contraception.
- Abortion.
- Prenatal sex-determination.
- In vitro fertilization (IVF).
- Artificial Insemination by Husband (AIH).
- Artificial Insemination by Donor (AID).
- Surrogate motherhood.
- Semen Intra-fallopian Transfer (SIFT).
- Gamete Intra-fallopian Transfer (GIFT).
- Zygote Intra-fallopian Transfer (ZIFT).
- Genetic Engineering.

## **6. The Family and Society in Medical Ethics**

- The Ethics of human sexuality.
- Family Planning perspectives.
- Prolongation of life.
- Advanced life directives – The Living Will
- Euthanasia
- Cancer and Terminal Care

## **7. Profession Ethics**

- Code of conduct.
- Contract and confidentiality.
- Charging of fees, Fee-splitting.
- Prescription of drugs.
- Over-investigating the patient.
- Low – Cost drugs, vitamins and tonics.
- Allocation of resources in health care.
- Malpractice and Negligence.

## **8. Research Ethics**

- Animal and experimental research / humaneness.
- Human experimentation.
- Human volunteer research — Informed Consent Drug trials.

## **9. Ethical workshop of cases**

- Gathering all scientific factors.
- Gathering all human factors.
- Gathering all value factors.
- Identifying areas of value — conflict, setting of priorities
- Working out criteria towards decisions.

## **Recommended Reading**

1. Francis C.M., Medical Ethics, 1 Ed, 1993, Jaypee Brothers, New Delhi.
2. Good Clinical Practices:GOI Guidelines for clinical trials on Pharmaceutical Products in India ([www.cdsco.nic.in](http://www.cdsco.nic.in))
3. INSA Guidelines for care and use of Animals in Research – 2000.
4. CPCSEA Guidelines 2001 ([www.cpcsea.org](http://www.cpcsea.org).)
5. Ethical Guidelines for Biomedical Research on Human Subjects, 2000, ICMR, New Delhi.
6. ICMR Guidelines on animal use 2001, ICMR, New Delhi.

## **CHAPTER V- Syllabus**

### **M D ANAESTHESIOLOGY**

#### **Goals:**

The goals of three year degree course in Anaesthesiology (two years for post diploma in Anaesthesia) would be to train a MBBS doctor who after the satisfactory completion of which shall:

1. Practice independently the art and science of anaesthesiology and resuscitation effectively and ethically, backed by scientific knowledge and skill base.
2. Undertake responsibilities in critical care unit, trauma unit, and respiratory therapy unit of unconscious patients requiring ventilatory support.
3. Undertake acute and chronic pain management.
4. Continue to evince keen interest in continuous professional development irrespective of whether he is in a teaching institution or in private anaesthetic practice.
5. Be a dedicated, motivated teacher who is always keen to train or to share his knowledge and skills with a colleague or junior or any learner.

#### **Objectives:**

The following objectives are laid out to achieve the goals of the course. These objectives have to be achieved by the candidates by the time of completion of the course. The objectives may be considered under the following headings.

1. Knowledge (cognitive domain).
2. Skills (psychomotor domain).
3. Attitudes communication skills, human values and ethical practice..

At the end of the training the candidate must be able to:

#### **Knowledge:**

1. Demonstrate understanding of basic sciences relevant to anaesthesia.
2. Describe the anaesthetic management of common and uncommon surgical ailments belonging to various branches of surgery, at all ages requiring operative interventions with a basic knowledge of the aetiology, pathophysiology and the surgical treatment of the conditions.
3. Describe the underlying theoretical background of mechanism of pain perception and pain management.
4. Describe the theory of the underlying aetiology, mechanism and management of the conditions requiring resuscitation.
5. Demonstrate, understanding of the theoretical base of polytrauma and the science of resuscitation-Basic life support and advanced cardiac life support.
6. Recognise the conditions that may be outside the area of his competence and refer them to an appropriate specialist prior to anaesthetising them.
7. Advice regarding the anaesthetic management of any surgical case and to carry out this management effectively.
8. Update himself / herself by self-study and by attending courses, conferences and seminars relevant to anaesthesia.
9. Teach and guide his team colleagues and students.
10. Demonstrate understanding of medicolegal aspects of anaesthesia.

11. Demonstrate basic knowledge of the administrative aspects of operating room complex.
12. Undertake audit, use information technology tools and carry out research, both basic and clinical, with the aim of publishing the work and presenting the same at various scientific fora.

### **Skills:**

1. Perform pre-anaesthetic evaluation of patients undergoing surgery by taking, proper clinical history, examining the patient, ordering relevant investigations and interpreting them to have additional information about the surgical condition, and or the associated medical condition, which warrant the modification of the proposed anaesthetic management.
2. Administer anaesthesia (general and or regional) to common surgical operations independently and to super specialties like cardiac surgery, neurosurgery etc. with the help of a staff anaesthesiologist.
3. Provide basic life support (BLS) and advanced cardiac life support (ACLS).
4. Manage airway and perform ventilatory care etc., of unconscious and poly-trauma cases as a member of trauma team and critical care unit team.
5. Undertake complete patient monitoring including preoperative, intra-operative and postoperative pain and ventilatory care of the patients.
6. Perform acute and chronic pain management.

### **Attitudes and Communication Abilities:**

1. Adopt ethical principles in all aspects of his anaesthetic practice. Professional honesty and integrity are to be fostered. Anaesthesia care is to be delivered to all in need, irrespective of the social status, caste, creed or religion of the patient.
2. Develop communication skills, in particular the skill to explain the various options available in the anaesthetic management, critical care, pain management and to obtain a true informed consent from the patient.
3. Provide leadership in the operating room environment and get best out of the team in a congenial working atmosphere.
4. Apply high moral and ethical standards while carrying out human or animal research.
5. Be humble and accept the limitations in his knowledge and skill and to ask for help from colleagues and superiors when needed.
6. Respect patient's rights and privileges including patient's right to information and right to seek a second opinion.

### **Course Contents:**

It includes topics not only of anaesthesiology but also those aspects of all the other branches of medicine relevant to anaesthesia viz., medicine and its allied subjects, surgery and its allied branches, pediatrics, applied anatomy, physiology, pathology, pharmacology, microbiology etc. It is intended as a guide to the candidates and it is not comprehensive. As and when there is newer development, it becomes eligible for inclusion. Hence, the candidates should be familiar with the current content of the scientific journals and reviews of major topics, in anaesthesia, critical care and pain medicine.

1. History of anaesthesiology
2. Basic sciences related to anaesthesia including anatomy, physiology, pharmacology, biochemistry, patho physiology, immunology and genetics.

3. Medicine applied to anaesthesiology.
4. Physics related to anaesthesiology, electronics, computers and lasers, in anaesthesiology. Internet/Medline and its uses and applications
5. Anaesthesiology.
  - a. Pre anaesthetic evaluation and preparation.
  - b. Principles and practice of anaesthesiology including pre, per and post-operative care, of patients belonging to general surgery and other subspecialties like cardiothoracic surgery, neurosurgery, orthopaedics, plastic surgery and surgical endocrinology, surgical oncology, paediatric, obstetrics and gynaecology, ENT, ophthalmology, urology, dental surgery, laparoscopic surgery etc.
  - c. Blood transfusion fluid and electrolyte balance, acid base balance.
  - d. Fires and explosion in operation theatre.
  - e. Operation theatre sterilization procedures.
6. Pain clinic organization and management, pain pathway, and management of pain.
7. Respiratory therapy and management of both acute and chronic respiratory insufficiencies and ventilator commitments in,ICU
8. Critical care anaesthesiology and trauma care unit management.
  - a. Different methods of anaesthetic techniques.
  - b. Regional anaesthesia including spinal, epidural and caudal etc.
  - c. Local anaesthesia including nerve blocks.
  - d. Anaesthesia in abnormal environments like high attitude anaesthesia etc
  - e. Complication in anaesthesiology and their management perioperatively.
  - f. Anaesthesia for day care surgery.
  - g. Anaesthesia for diagnostic and therapeutic procedures like in endoscopy CT Scan MRI suites etc
9. Informed consent/medicolegal issues: understanding the implications of acts of omission and commission in practice. Issues regarding consumer protection implications in medicolegal cases.
10. Communication skills with colleagues teachers, patients, and patients relatives and assistant staff
11. Principles of anaesthesia audit, understanding the audit process and outcome; methods adopted for the same.
12. Essentials of Research methodology:
  - a. Basics of biostatistics and its application.
  - b. Ability to undertake clinical and basic research.
  - c. Ability to publish results of one's work.
13. Principles of evidence based medicine and its application in anaesthetic practice.
14. Medical ethics/social responsibilities of the anaesthesiologists.
15. Record keeping: Ability to keep records as scientifically as possible; knowledge of computers is beneficial.

## TECHNICAL SKILLS TO BE ACQUIRED:

The list within the tables indicates the procedures that the student should, by the end of the course, be able to perform independently (PI) by himself / herself, should have performed with assistance (PA) should have observed (O) or assisted (A) during the course. NA - Not Applicable

Skills may be considered under the following headings:

1. Basic graduate skills.
2. Anaesthesia procedures.
3. Critical care procedures.
4. Emergency room procedures.
5. Pain alleviation procedures.
6. Miscellaneous
  - a. Disaster management camps
  - b. Mass casualties
  - c. Safety in Anaesthesia and occupational hazards
  - d. Planning of operation theatres
  - e. Selection and purchase of equipment

### 1. Basic Graduate Skills:

The student should have acquired certain skills during his under graduation and internship. These skills have to be reinforced at the beginning of the training period.

#### I. These include:

Procedure	Category	Year	No.
Insertion of I.V. lines	PI	I	100
Insertion of Nasogastric Tubes	PI	I	100
Recording of Vital Signs.	PI	I	100

#### II. Anaesthesia Procedures:

Orotracheal intubation	PI	I/II/III	100
Nasotracheal Intubation	PI	I/II/III	50
Supraglottic airway devices	PI	I/II/III	50
Procedure	Category	Year	No.
Airway (oral/nasal) insertion	PI	I/II/III	100
Subarachnoid block	PI	I/II/III	100
Epidural block (including caudal)	PI	I/II/III	10
Brachial plexus block	PI	I/II/III	25
Intravenous regional analgesia	PI	II/III	25
Three in one block	PI	II/III	05
Rectus sheath block	PI	II/III	05
Hernia block	PI	II/III	05
Other nerve blocks	PI	II/III	25

Major anaesthesia procedures	PA/PI	II/III* per year	100
Minor anaesthesia procedures	PA/PI	II/III* per year	200
Tracheal intubation using intubating video laryngoscope CMAC and other airway devices Ultrasound guided regional anaesthesia procedures		25 Per year  25/Per year	

### III. Critical Care Procedures:

Insertion of arterial lines	PI	II/III	5
Insertion of central venous lines	PI	II/III	5
Intercostal drainage	O	II/III	NA
Tracheostomy	O	III	NA
Ventilatory management of patients	PI	II/III	50
Sampling for & interpretation of ABG	PI	II/III	100
Correction of electrolyte imbalance	PI	II/III	100
Fiberoptic bronchoscopy	O	III	05
Minitracheostomy	O	III	05
Insertion of SWG catheter Ultra sound guided placement of arterial and central lines.	O PA	III II/III	NA 20

### IV. Emergency Room Procedures:

Cardiopulmonary resuscitation (BLS & ACLS)	PI	I/II/III	As and when required
Management of cardiac failure	PI	II/III	10
Management of respiratory failure	PI	II/III	20
Management of shock	PI	II/III	20
Management of airway obstruction	PI	I/II/III	25

### V. Pain Alleviation Procedures:

Stellate ganglion block	PA	III	2
Coeliac ganglion block	PA	III	2
Trigeminal nerve block	PA	III	2
Labour analgesia	PI	II/III	10
Post-operative pain management	PI	II/III	100
Neurolysis, & other nerve ablation procedures	PA	III	2
TENS Ultrasound guided & C-ARM guided procedures such as Transforaminal blocks ,Inter laminar block e.t.c	PI	II/III	2 5

### Teaching and Learning Activities



A candidate pursuing the course should work in the institution as a full time student. No candidate should be permitted to run a clinic/laboratory/nursing home, while studying postgraduate course. Each year should be taken as a unit for the purpose of calculating attendance.

Every student shall attend teaching and learning activities during each year as prescribed by the department and not absent himself/herself from work without valid reasons.

A list of teaching and learning activities designed to facilitate students acquire essential knowledge and skills outlined is given below.

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.
  - a. **Didactic Lectures:** Recommended for selected common topics for postgraduate students of all specialities. Few topics are suggested as examples:
    - i. Bio-statistics.
    - ii. Use of library
    - iii. Research Methods
    - iv. Medical code of Conduct and Medical Ethics.
    - v. National health and Disease Control Programs.
    - vi. Communication Skills etc.
    - vii. Initial introductory lectures about the subject.

These topics may preferably taken up in the first few weeks of the 1<sup>st</sup> year.

- b. **Integrated Lectures:** These are recommended to be taken by multidisciplinary teams for selected topics, e.g. jaundice, diabetes mellitus, thyroid etc.
2. **Journal Club:** Recommended to be held once a week. All the PG students are expected to attend and actively participate in discussion and enter relevant details in the logbook. Further, every candidate must make a presentation from the allotted journal(s) of selected articles at least four times a year and a total of 12 presentations in three years. The presentations would be evaluated using checklists and would carry weightage for internal assessment (See checklist in chapter IV). A time table with names of the students and the moderator should be announced at the beginning of every year.
3. **Subject seminar:** Recommended to be held once a week. All the PG students are expected to attend and actively participate in discussion and enter relevant details in the logbook. Further, every candidate must present on selected topics, at least four times a year and a total of 12 seminar presentations in three years. The presentations would be evaluated using checklists and would carry weightage for internal assessment (See checklist in chapter IV). A timetable for the subject, with names of the student and the moderator should be scheduled at the beginning of every year.
4. **Student Symposium:** Recommended as an optional multidisciplinary programme. The evaluation may be similar to that described for subject seminar.
5. **Ward Rounds:** May be preanesthetic /post anaesthesia rounds or teaching rounds.
  - a. **Service Rounds:** Postgraduate students should do ward rounds every day.

- viii. For preanaesthetic evaluation of the patients posted for operation.
- ix. And to do the postanaesthetic follow up of operated patients for alleviation of post-operative pain, fluid management and for diagnosis and management of any of the post-operative sequelae.

- b. Teaching Rounds: Every unit should have grand rounds for teaching clinical methods and preanaesthetic evaluation.

Entries of (a) and (b) should be made in the logbook

- 6. Mortality & Morbidity Meetings:** Recommended once a month for all postgraduate students. Presentation be done by rotation and by the students who had conducted/assisted anesthetic management.
- 7. Teaching Skills:** Postgraduate students must teach undergraduate students (e.g. medical, nursing) by taking demonstrations, bed side clinics, tutorials, lectures etc. Assessment is made using a checklist by faculty. Record of their participation should be kept in logbook. Training of postgraduate students in educational technology is recommended.
- 8. Continuing Medical Education Programmes (CME):** At least 2 state / national level CME programmes should be attended by each student in 3 years.
- 9. Conferences:** Attending conferences is optional. However participation & presentation of scientific paper is mandatory in 2 national, zonal and state conferences.
- 10. Group discussions-**Students are grouped into batches of 20 and a topic is assigned for discussion which is moderated by a panel of faculties.
- 11. Case presentation-**Clinical case presentation is held once in 15 days where in a post graduate presents detailed history, examination and anesthetic management which will be discussed by a panel of discussion
- 12. Bed side clinics or teaching-**Discussion of anesthetic management and relevant clinical material will be carried out on daily basis.

### **Dissertation:**

Every candidate pursuing MD degree course in anesthesiology is required to carry out work on a selected research project under the guidance of a recognized post-graduate teacher. The results of such a work shall be submitted in the form of a dissertation.

- a. The dissertation is aimed to train a postgraduate student in research methods and techniques. It includes identification of a problem, formulation of a hypothesis, search and review of literature, getting acquainted with recent advances, designing of a research study, collection of data, critical analysis, comparison of results and drawing conclusions.
- b. Every candidate shall submit to Deemed to be University in the prescribed proforma, a synopsis containing particulars of proposed dissertation work within six months from the date of commencement of the course on or before the dates notified by the Deemed to be University. The synopsis shall be sent through the proper channel.

- c. Such synopsis will be reviewed and the dissertation topic will be registered by the Deemed to be University. No changes in the dissertation topic or guide shall be made without prior approval of the Deemed to be University.
- d. The dissertation should be written under the following headings:
  - i. Introduction
  - ii. Aims and objectives of study
  - iii. Review of literature
  - iv. Material and methods
  - v. Results
  - vi. Discussion
  - vii. Conclusion
  - viii. Summary
  - ix. References
  - x. Tables
  - xi. Annexure
- e. The written text of dissertation shall be not less than 50 pages and shall not exceed 150 pages excluding references, tables, questionnaires and other Checklists. It should be neatly typed in double line spacing on one side of paper (A4 size, 8.27" x 11.69") and bound properly. Spiral binding should be avoided. The dissertation shall be certified by the guide, head of the department and head of the institution.
- f. Four copies of dissertation thus prepared shall be submitted to the Deemed to be University, six months before final examination, on or before the dates notified by the Deemed to be University.
- g. The dissertation shall be valued by examiners appointed by the Deemed to be University. Approval of dissertation work is an essential precondition for a candidate to appear in the Deemed to be University examination.
- h. **Guide:** The academic qualification and teaching experience required for recognition by this Deemed to be University as a guide for dissertation work shall be as per Medical Council of India, Minimum qualifications for Teachers in Medical Institutions regulations, 1998. Teachers in a medical college/institution having a total of eight years teaching experience out of which at least five years teaching experience as lecturer or Assistant Professor, gained after obtaining postgraduate degree, shall be recognized as postgraduate teachers.

**A co-guide** may be included, provided the work requires substantial contribution from a sister department or from another medical institution recognized for teaching/training by the Deemed to be University / Medical Council of India. The co-guide shall be a recognized postgraduate teacher.

- a. **Change of guide:** In the event of a registered guide leaving the college for any reason or in the event of death of the guide, guide may be changed with prior permission from the Deemed to be University.
- b. For some more details regarding guide etc please see Chapter I and for books on research methodology, ethics, etc see Chapter IV.

### **Rotation and Posting in other departments**

The listed knowledge and skills are to be learnt over a period of 3 years. The process is a continuous one. However the recommended period and timing of training in basic sciences, allied departments and speciality departments are given below. The total duration of postings in allied and sub specialities will be 8 months and the

remaining 2 years and 4 months in the parent department.

**Basic Sciences:** Rotation in other departments like, Anatomy, to be done as concurrent studies during the first year of training. At least two hours may be spent in the first six months of the course. Basic science relevant to anesthesia can be studied in the respective departments in the afternoons.

**Anatomy:** Special emphasis for the dissection of larynx, trachea, heart, various nerves & plexuses.

**Allied Speciality:** Students should be posted in ICU, ICCU, SICU (Trauma unit) and pain clinic during second year of training for 2 weeks in each, for a total duration of 2 months.

**Other Sub specialities of Anesthesia:**

Postings to other sub speciality departments will be, during second year and the duration of postings is as shown below:

Pain clinic	4 weeks
Cardiothoracic surgery	weeks 4
Neuro surgery	weeks 4
Paediatric surgery	weeks 4
Cancer surgery	weeks 2
Oromaxillofacial surgery	weeks 2
Plastic surgery	weeks 2
Urology	weeks 2
Laparoscopic and endoscopic surgery	weeks 2
Anaesthesia for investigative procedures like CT scan, lithotripsy, cardiac cath lab	weeks 2
Total	weeks 28

**Year wise Structured Training Schedule**

**First Year:**

1. Basic Sciences related to anaesthesiology: theoretical knowledge, frequent visits to anatomy dissection halls & museum, to revise the relevant subjects.
2. Theoretical knowledge of anaesthesiology & resuscitation: special emphasis on clinical examination of patients, learning clinical methods, arriving at correct diagnosis.
3. Basic knowledge about
  - a. Computers in anaesthesia, Medline, Internet.
  - b. Bio statistics.
  - c. Medical audit.
  - d. Medicolegal aspects.
  - e. Research methodology.
  - f. Evidence based medicine.
  - g. Medical ethics and social responsibilities of anesthesiologists.
4. Learning of communication skills.
5. Anaesthesia Skills

- a. Preanaesthetic evaluation /under supervision.
- b. Monitoring of patients throughout perioperative period.
- c. Assisting, setting up of anaesthesia machine, monitors and ventilator.
- d. Assisting the conduct of anaesthesia for major surgeries; knowledge about the complications of anaesthesia.
- e. Assisting for short anaesthesia initially and later on doing independently under supervision
- f. Conduct of anaesthesia OPD.
- g. CPR training and mastering of BLS & ACLS.

**6. Dissertation:** Choosing a topic of dissertation, submission of synopsis to the Deemed to be University, collection of literature, conduct of pilot studies.

### **7. Soft skills development.**

#### **Second Year:**

Theoretical knowledge of allied subjects, subspecialities of anaesthesia. Assisting senior anaesthesiologists in specialised branches like paediatric surgery, cardiothoracic surgery, critical care trauma etc.

Anaesthetic Skills: At the end of second year the student should be capable of;

Anaesthetising patients without assistance but under supervision.

Identifying the complications of anaesthesia and manage them independently but under supervision.

Setting up of anaesthesia machines, monitors and ventilator independently.

Conference & Workshops: Attending one state level and one national level conference/CME and presentation of a scientific paper.

Dissertation: Carrying out of the dissertation study work, periodic reviews, interaction with guide. Organisation of the data, writing up of the manuscript of dissertation at the end of second year.

The student should be actively involved in presentation of seminars, journal clubs, case presentation/discussions.

#### **Third Year:**

1. The student should be well versed with basics, allied subjects and recent advances in the respective fields.
2. Anaesthesia Skills: At the end of the third year the candidate should be able to make independent decisions as regards anaesthesia, pain management and post operative care of all kinds of patients.
3. Teaching Activities: Final year student should take a lead in conducting seminars, journal clubs, case discussions, panel discussions with I & II year students. The third year students should also involve in teaching undergraduate students especially bedside clinics.
4. Dissertation: The completed dissertation must be submitted to the Deemed to be University, 6 months before the examination, before the notified date.
5. The student must get expertise in the specialised procedures as noted in the course content table.

#### **Monitoring Learning Progress**

It is essential to monitor the learning progress of each candidate through continuous appraisal and regular assessment. It not only also helps teachers to evaluate students, but also students to evaluate themselves. The monitoring shall be done by the staff of the department based on participation of students in various

teaching / learning activities. It may be structured and assessment be done using checklists that assess various aspects. Checklists are given in Chapter IV. The learning outcomes to be assessed should include:

- Personal attitudes
- Acquisition of knowledge
- Clinical and operative skills
- Teaching skills
- Dissertation

1. **Personal Attitudes: The essential items are:**

- a. Caring attitude
- b. Initiative
- c. Organizational ability
- d. Potential to cope with stressful situations and undertake responsibility
- e. Trust worthiness and reliability
- f. To understand and communicate intelligibly with patients and others
- g. To behave in a manner which establishes professional relationships with patients and colleagues
- h. Ability to work in a team.
- i. A critical enquiring approach to the acquisition of knowledge.

The methods used mainly consist of observation. It is appreciated that these items require a degree of subjective assessment by the guide, supervisors and peers.

2. **Acquisition of knowledge:** The methods used comprise of 'Log Book' which records participation in various teaching / learning activities by the students. The number of activities attended and the number in which presentations are made are to be recorded. The log book should periodically be validated by the supervisors. Some of the activities are listed. The list is not complete. Institutions may include additional activities, if so, desired.

- a. **Journal review meeting (Journal Club):** The ability to do literature search, in depth study, presentation skills, and use of audio – visual aids are to be assessed. The assessment is made by faculty members and peers attending the meeting using a checklist (see Model Checklist – I, Chapter IV)
- b. **Seminars / Symposia:** The topics should be assigned to the student well in advance to facilitate in depth study. The ability to do literature search, in depth study, presentation skills and use of audio – visual aids are to be assessed using a checklist (see Model Checklist II, Chapter IV)
- c. **Clinico – pathological conferences:** This should be a multidisciplinary case study of an interesting case to train the candidate to solve diagnostic and therapeutic problems by using an analytical approach. The presentation(s) are to be assessed using a checklist similar to that used for seminar.
- d. **Medical Audit:** Periodic morbidity and mortality meeting be held. Attendance and participation in these must be insisted upon. This may not be included in assessment.

### 3. **Clinical Skills:**

- a. **Day to Day work:** Skills in outpatient and ward work should be assessed periodically. The assessment should include the candidate's sincerity and punctuality, analytical ability and communication skills (see Model Checklist III, Chapter IV)
- b. **Clinical Meeting:** Candidates should periodically present cases to his peers and faculty members. This should be assessed using a check list (see Model Checklist IV, Chapter IV)
- c. **Clinical and Procedural skills: The candidate should be given graded responsibility to enable learning by apprenticeship. The performance is assessed by the guide by** direct observation. Particulars are recorded by the student in the log book. (Table No. 3, Chapter IV)

4. **Teaching skills:** Candidates should be encouraged to teach undergraduate medical students and paramedical students, if any. This performance should be based on assessment by the faculty members of the department and from feedback from the undergraduate students. (See Model Checklist V, Chapter IV)

5. **Dissertation in the Department:** Periodic presentations are to be made in the department. Initially the topic selected is to be presented before submission to the Deemed to be University for registration, again before finalization for critical evaluation and another before final submission of the completed work (see Model Checklist IV & VII, Chapter IV)

6. **Periodic tests:** The department may conduct three tests, two of them be annual tests, one at the end of first year and the other in the second year. The third test may be held three months before the final examination. The tests may include written papers, practical / clinical and viva voce.

7. **Work diary / Log Book:** Every candidate shall maintain a work diary and record his/her participation in the training programmes conducted by the department such as journal reviews, seminars, etc. Special mention may be made of the presentations by the candidate as well as details of clinical or laboratory procedures, if any conducted by the candidate.

8. **Records:** Records, log books and marks obtained in tests will be maintained by the Head of the Department and will be made available to the Deemed to be University or MCI.

### **Log Book**

The log book is a record of the important activities of the candidates during his training. Internal assessment should be based on the evaluation of the log book. Collectively, log books are a tool for the evaluation of the training programme of the institution by external agencies. The record includes academic activities as well as the presentations and procedures carried out by the candidate.

**Format for the log book** for the different activities is given in Tables 1, 2 and 3 of Chapter IV. Copies may be made and used by the institutions.

**Procedure for defaulters:** Every department should have a committee to review

such situations. The defaulting candidate is counseled by the guide and head of the department. In extreme cases of default the departmental committee may recommended that defaulting candidate be withheld from appearing the examination, if she/he fails to fulfill the requirements in spite of being given adequate chances to set himself or herself right.

### **Scheme of Examination**

#### **a. Theory:**

Written examination shall consist of four question papers, each of three hours duration. Each paper shall consist of two long questions carrying 20 marks each, three essays carrying 10 marks each and 6 short essay questions each carrying 5 marks. Total marks for each paper will be 100. Questions on recent advances to be asked in paper IV. Distribution of topics for each paper will be as follows:

#### **Paper I:**

1. Basic Science as applicable to anaesthesia.
  - a. Anatomy.
  - b. Physiology.
  - c. Pharmacology.
  - d. Physics.
  - e. Biochemistry.
  - f. Pathology.
  - g. History.
  - h. Equipments.
2. Equipments-Anaesthesia work station, Boyle's machine, breathing circuits, drug delivery systems, Vaporizers, Miscellaneous(Patient monitoring)
3. Applied physics in anaesthesiology.
4. History of anaesthesia
5. Anaesthetic agents

#### **Paper II: Clinical Practice of Anaesthesiology**

1. Neuroanaesthesia and trauma
2. Paediatric Anaesthesia
3. Obstetrics and Gynaecology
4. CVS
5. RS
6. Endocrine & Obesity

#### **Paper III: Clinical Practice of anaesthesia.**

1. Gastro intestinal system
2. Renal system
3. ENT and Ophthalmology
4. Orthopaedics
5. Geriatrics
6. Plastic surgery
7. Regional anaesthesia
8. Airway management
9. Haematology
10. Anaesthesia for dental surgeries



**Paper IV:**

1. Critical care & PACU
2. Pain medicine
3. Recent advances
4. Bio-statistics
5. Simulation in anaesthesia
6. USG
7. Anaesthesia for organ procurement and transplantation
8. Brain death
9. Day care surgery and Non OR Anaesthesia
10. Disaster management
11. Patient care in extreme environment –High & low pressure and in space

**Clinical Examination: 200 marks**

Each candidate shall appear for the clinical examination where in clinical skills & competence of candidates for under taking independent work as a specialist will be scrutinized .Each candidate should examine one long case (100 marks) and two short cases (50 marks each) which may include pain and critical care cases.

**Viva-Voce: 100 marks**

Viva-Voce examination shall aim at assessing depth of knowledge, logical reasoning, confidence and oral communication skills. The total marks shall be 100 and the distribution of marks shall be as under:

**a. For examination of all components of syllabus 80 marks**

All examiners will conduct viva-voce conjointly on candidate’s comprehension, analytical approach expression and interpretation of data. It includes all components of course contents. In addition the candidate may also be given, instruments/ equipments, X-ray images, ABG reports, ECG strips, drugs ultrasound/echocardiography reports & specimens. It includes discussion on dissertation also.

**b. For teaching skills (Pedagogy) 20 marks**

A topic to be given to each candidate in the beginning of clinical examination. He/ She is asked to make presentation on the topic for 8 to 10 minutes.

Maximum marks for	Theory	Practical	Viva	Grand Total
M D Anaesthesiology	400	200	100	700

**Recommended Books and Journals**

**a. Books:**

1. Practice of Anaesthesiology - Wylie - Churchill – Davidson-7th edition
2. General Anesthesia –Prys Roberts-5th edition
3. Anaesthesia - Two volumes, Ronald D, Miller-8th edition
4. Anatomy for Anaesthetist - Harold Eillis-9Th edition
5. Understanding Anaesthetic Equipments - Dorsch & Dorsch 5 th edition
6. Emergency Anaesthesia – Thronton 2nd edition

7. Principles of Obstetric - Anaesthesia - J. S. Crawford.4th edition
8. Physics for Anaesthetist - Muschnin & Macintosh.
9. Neurosurgical Anaesthesia - Hunter
- 10.Paediatric Anaesthesia - Gregory.
- 11.Cardiac Anaesthesiology - 2 volumes - Jonathan Benumaf.
- 12.Anaesthesia and co existing diseases - Stoelting.
- 13.Anaesthesia Equipment - Ehrenwerth and James. B. Eiscnkraft
- 14.TextBook of Anaesthesia - A. R. Aitken Head & G. Smith
- 15.Anaesthesia for infants and children – Smith 8 th edition
- 16.Obstetrics Anaesthesia - Bonica
- 17.Regional Anaesthesia - Macintosh series
- 18.Epidural Analgesia - Bromage
- 19.Medical problems of Anaesthesia - Kaulman
- 20.Principles of Anaesthesiology - Collins
- 21.Anaesthesia for Orthopedic Surgery - Zauder and others
- 22.Neural Blockade - Cousins
- 23.Cardiac Anaesthesia,The Echo era – Kaplan,6th edition
- 24.Thoracic Anaesthesia - Kaplan and Muschin
- 25.Regional Anaesthesia - Labot
- 26.Drugs Interactions & other basic Medical science - Anaesthesia speciality books.
- 27.Anaesthesia for Uncommon diseases-Lee.A.Fleisher 6 th edition
- 28.Pharmacology and physiology for anaesthetic practice-Stoelting 5thedition.
- 29.Morgan 5th edition
- 30.Lee’s Synopsis of anaesthesia-Lee
- 31.Barash text book of anaesthesiology 8th edition
- 32.Ward equipment 6th edition
- 33.Yao &Artusio 7th edition
- 34.Schneider –Obstetric anaesthesia.

#### **b. Journals**

1. Anesthesia and Analgesia
2. Anaesthesiology
3. Anaesthesia I
4. Acta Anaesthesia Scandinavica
5. Canadian Journal of Anaesthesia
6. Indian Journal of Anaesthesiology
7. British Journal of Anaesthesia
8. Expert Anaesthesia
9. Recent advances in Anaesthesiology
- 10.Year Book of Anaesthesia
- 11.Anesthesia Clinics
- 12.Clinics inNorth America in Anaesthesiology
- 13.Journal of anaesthesiology and clinical pharmacology
- 14.European journal of anaesthesiology
- 15.Regional anaesthesia and pain medicine

**At the end of three 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 cellu-

lar 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, haematological, and immune systems, pregnancy related diseases, 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, Disease related to dysfunction of hepatobiliary, Muscular, Connective Tissues and Immune system, management of perioperative Infection, neuromuscular Disorders, poisoning, Respiratory/ Cardiac Arrest 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 and other relevant equipment including physical principles involved in their construction and functioning.

**F. Perioperative Anaesthesia management** including pre-operative evaluation, intraoperative management as well as postoperative 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 and 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 and Peripheral Nerve blocks) and Local Anaesthesia, including various postures required for anaesthetic / surgical procedures, their effects and Recent Advances for most minor to supra manor surgeries in the field of :

- General surgery: e.g. minor cases like haemorrhoidectomy to supra major cases like renal transplant.
- Gynaecology and Obstetrics
- ENT and Head and Neck
- Orthopaedics
- Ophthalmology
- Paediatric and Neonate: Differences between adult and paediatric Anatomy, Physiology, Pharmacology, Anaesthesia principles, paediatric / neonatal emergencies, postoperative care, fluid and ventilator management.
- Cardiac, Vascular and Thoracic: Conduct of closed heart as well as open heart surgeries (Valvular, Ischemic, Congenital – Cyanotic and 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, post-operative 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., other open urological procedures like pyeloplasty, urethroplasty, 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, cosmetic surgeries etc.
- Dental: Monitored Anaesthesia Care, anaesthetic management of pedodontia patients, maxillofacial surgeries including TMJ Ankylosis, Awake, Retrograde and Fibre optic 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, appendectomy, cholecystectomy, nephrectomy and other major procedures in gastro, uro, onco and paediatric lap surgeries.
- Anaesthesia for various diagnostic, therapeutic, and specialized procedures
- Anaesthesia for Geriatric patients
- Anaesthesia for surgery using LASER
- Anaesthesia / **Sedation techniques outside operating room** : Electroconvulsive shock therapy (ECT), Electrophysiological 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, endoscopy room procedures like ERCP, balloon dilatation,etc.

## **H. History of Anaesthesia**

**I. Airway Management:** Assessment of difficult airway, Awake, Retrograde, Use of intubating LMAs, Intubating Stylets, Various laryngoscopes designated for difficult airway, insertion of combitube, ability to perform cricothyrotomy and use of Venturi, Minitrach, fiberoptics intubations, and use of video laryngoscopes.

**J. Basic and Advanced Cardiopulmonary and Cerebral Resuscitation (CPCR)** for all age groups for patients under different situations e.g., neonates, pregnant females, poisoning cases, trauma victims etc.

**K. Acid base and fluid management** including use of crystalloids, colloids, blood and blood products

**L. Arterial, Central venous and P.A. Lines:** Establishment, management and interpretation.

**M. Anaesthetic drugs** used in perioperative care.

**N. Equipments** (Minor to advanced monitoring) – their uses, maintenance, sterilisation and care

**O. Medical gases:** knowledge of manufacturing, storage and central pipeline systems

- P. Day Care/Outpatient Anaesthesia**
  - Q. Remote Location Anaesthesia:** Anaesthesia 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 and Chronic
  - V. Critical Care practice** including oxygen therapy, respiratory therapy, ventilator support, haemodynamic monitoring, prevention and management of multi organ failure, and care of patients with brain damage and 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
  - AB. Medial Audit**
  - AC. Quality Assurance**
  - AD. Anaesthesia Standards:** e.g. Minimum monitoring standard
  - AE. Medicolegal aspects** in Anaesthesia
  - AF. Ethics** in Anaesthesia
  - AG. Principles of evidence** Based Medicine
  - AH. Basic Research** Methodology and Clinical Trials
  
  - AI. Bio-statistics**
  - AJ. Computers:** Utility, computer assisted learning and data storage, Computerised anaesthesia records.
  - AK. Skills:** for planning of operation theatre, pain clinic, recovery room, intensive care etc., including selection and purchase of equipments.
- DIPLOMA IN ANAESTHESIOLOGY (DA)**

### Goals:

The goals of two year diploma course in anaesthesiology would be to train a MBBS doctor who after the satisfactory completion of which shall:

1. Practice independently the art and science of anaesthesiology and resuscitation effectively and ethically, backed by scientific knowledge and skill base.
2. Undertake responsibilities in critical care unit, trauma unit, and respiratory therapy unit of unconscious patients requiring ventilatory support.
3. Undertake acute and chronic pain management.
4. Continue to evince keen interest in continuous professional development irrespective of whether he is in a teaching institution or in private anaesthetic practice.

### Objectives:

The following objectives are laid out to achieve the goals of the course. These objectives have to be achieved by the candidates by the time of completion of the course. The objectives may be considered under the following headings.

1. Knowledge (cognitive domain).
2. Skills (psychomotor domain).
3. Attitudes, communication skills, human values and ethical practice.

At the end of the training the candidate must be able to:

**1. Knowledge:**

- a. Demonstrate understanding of basic sciences relevant to anaesthesia.
- b. Describe the anaesthetic management of common and uncommon surgical ailments belonging to various branches of surgery, at all ages requiring operative interventions with a basic knowledge of the aetiology, pathophysiology and the surgical treatment of the conditions.
- c. Describe the underlying theoretical background of mechanism of pain perception and pain management.
- d. Describe the theory of the underlying aetiology, mechanism and management of the conditions requiring resuscitation.
- e. Understanding of the theoretical base of polytrauma and the science of resuscitation(Basic life support &Advanced cardiac life support)
- f. Recognise the conditions that may be outside the area of his competence and refer them to an appropriate specialist prior to anaesthetising them.
- g. Advice regarding the anaesthetic management of any surgical case and to carry out this management effectively.
- h. Update himself / herself by self-study and by attending courses, conferences and seminars relevant to anaesthesia.
- i. Understanding of medicolegal aspects of anaesthesia.

**2. Skills:**

- a. Perform pre-anaesthetic evaluation of patients undergoing surgery by

taking, proper clinical history, examining the patient, ordering relevant investigations and interpreting them to have additional information about the surgical condition, and or the associated medical condition, which warrant the modification of the proposed anaesthetic management.

- b. Administer anaesthesia (general and or regional) to common surgical operations independently and to superspecialities like cardiac surgery, neurosurgery etc. with the help of a staff anaesthesiologist.
- c. Provide basic life support (BLS) and advanced cardiac life support (ACLS).
- d. Manage airway and perform ventilatory care etc., of unconscious and polytrauma cases as a member of trauma team and critical care unit team.
- e. Undertake complete patient monitoring including preoperative, intra-operative and postoperative ventilatory care of the patients.
- f. Perform acute and chronic pain management.

### **3. Attitudes and Communication Abilities:**

- a. Adopt ethical principles in all aspects of his anaesthetic practice. Professional honesty and integrity are to be fostered. Anaesthesia care is to be delivered to all in need, irrespective of the social status, caste, creed or religion of the patient.
- b. Develop communication skills, in particular the skill to explain the various options available in the anaesthetic management, critical care, pain management and to obtain a true informed consent from the patient.
- c. Be humble and accept the limitations in his knowledge and skill and to ask for help from colleagues and superiors when needed.
- d. Respect patient's rights and privileges including patient's right to information and right to seek a second opinion.

### **Course Contents:**

It includes topics not only of anaesthesiology but also those aspects of all the other branches of medicine relevant to anaesthesia viz., medicine and its allied subjects, surgery and its allied branches, pediatrics, applied anatomy, physiology, pathology, pharmacology, microbiology etc. It is intended as a guide to the candidates and it is not comprehensive. As and when there is newer development, it becomes eligible for inclusion. Hence, the candidates should be familiar with the current content of the scientific journals and reviews of major topics, in anaesthesia, critical care and pain medicine

1. History of anaesthesiology.
2. Basic sciences related to anaesthesia including anatomy, physiology, pharmacology, biochemistry, patho physiology, immunology and genetics.
3. Medicine applied to anaesthesiology.
4. Physics related to anaesthesiology, electronics, computers and lasers, in anaesthesiology. Internet/Medline and its uses and applications
5. Anaesthesiology.
  - a. Pre anaesthetic evaluation and preparation.
  - b. Principles and practice of anaesthesiology including pre, per and post-operative care, of patients belonging to general surgery and other subspecialities like cardiothoracic surgery, neurosurgery, orthopaedics,

plastic surgery and surgical endocrinology, surgical oncology, paediatric, obstetrics and gynaecology, ENT, ophthalmology, urology, dental surgery, laproscopic surgery etc.

- c. Blood transfusion fluid and electrolyte balance, acid base balance.
- d. Fires and explosion in operation theatre.
- e. Operation theatre sterilization procedures.
6. Pain clinic organisation and management, pain pathway and management of pain.
7. Respiratory therapy and management of both acute and chronic respiratory insufficiencies and ventilator commitments in, I.C.U.
8. Critical care anaesthesiology and trauma care unit management.
  - a. Different methods of anaesthetic techniques.
  - b. Regional anaesthesia including spinal, epidural and caudal etc.
  - c. Local anaesthesia including nerve blocks.
  - d. Anaesthesia in abnormal environments like high altitude anaesthesia etc.
  - e. Complication in anaesthesiology and their management perioperatively.
  - f. Anaesthesia for day care surgery.
  - g. Anaesthesia for diagnostic procedure like endoscopy CT Scan MRI etc.
9. Informed consent/medicolegal issues: understanding the implications of omissions and commissions in practice. Issues regarding consumer protection implications in medicolegal cases.
10. Communication skills with colleagues, teachers, patients, and patients relatives and assistant staff
11. Principles of anaesthesia audit, understanding the audit process and outcome; methods adopted for the same.
12. Principles of evidence based medicine and its application in anaesthetic practice.
13. Medical ethics/social responsibilities of the anaesthesiologists.
14. Record keeping: Ability to keep records as scientifically as possible; knowledge of computers is beneficial.

### **TECHNICAL SKILLS TO BE ACQUIRED:**

The list within the tables indicates the procedures that the student should, by the end of the course, be able to perform independently (PI) by himself / herself, should have performed with assistance (PA) should have observed (O) or assisted (A) during the course. NA - Not Applicable. Skills may be considered under the following headings:

1. Basic graduate skills.
2. Anaesthesia procedures.
3. Critical care procedures.
4. Emergency room procedures.
5. Pain alleviation procedures.
6. Miscellaneous
  - a. Disaster management camps
  - b. Mass casualties
  - c. Safety in Anaesthesia and occupational hazards
  - d. Planning of operation theatres



e. Selection and purchase of equipments

**1. Basic Graduate Skills:**

The student should have acquired certain skills during his under graduation and internship. These skills have to be reinforced at the beginning of the training period. These include:

Procedure	Category	Year	No
Insertion of IV lines	PI	I	75
Insertion of nasogastric tubes	PI	I	75
Recording of vital signs.	PI	I	75

**2. Anaesthesia Procedures:**

Orotracheal intubation	PI	I/II	75
Nasotracheal Intubation	PI	I/II	25
Supraglottic airway devices	PI	I/II	25
Airway (oral/nasal) insertion	PI	I/II	75
Subarachnoid block	PI	I/II	100
Epidural block (including caudal)	PI	I/II	50
Brachial plexus block	PI	II	50
Intravenous regional analgesia	PI	II	10
Three in one block	PI	II	05
Rectus sheath block	PI	II	05
Hernia block	PI	II	05
Other nerve blocks	PI	II	05
Major anaesthesia procedures	PA/ PI	II* per year	100
Minor anaesthesia procedures	PA/ PI	II*per year	200
Tracheal intubation using flexible intubating video laryngoscope, CMAC and other airway devices		25	
Ultrasound Guided regional anaesthetic procedures.		25	
		*Per year	

**Critical Care Procedures:**

Procedure	Category	Year	No
Insertion of arterial lines	PI	II	25
Insertion of central venous lines	PI	II	25
Intercostal drainage	O	II	NA
Tracheostomy	O	II	NA
Ventilatory management of patients	PI	II	15
Sampling for & interpretation of ABG	PI	II	15
Correction of electrolyte imbalance	PI	II	15

Fiberoptic bronchoscopy	O	II	02
Minitracheostomy	O	II	02
Insertion of SWG catheter Ultrasound guided placement of arterial and central lines.	O	II	NA

### 3. Emergency Room Procedures:

Cardiopulmonary resuscitation (BLS & ACLS)	PI	I/II	As and when required
Management of cardiac failure	PI	II	5
Management of respiratory failure	PI	II	5
Management of shock	PI	II	5
Management of airway obstruction	PI	I/II	5
Management of trauma patients	PI	I/II	20

### 4. Pain Alleviation Procedures:

Stellate ganglion block	PA	II	2
Coeliac ganglion block	PA	II	2
Trigeminal nerve block	PA	II	2
Labour analgesia	PI	II	5
Post operative pain management	PI	II	100
Neurolysis & other nerve ablation procedures	PA	II	2
TENS	PI	II	2
Ultrasound guided & C-Arm guided pain procedures such as transforaminal blocks, inter laminar block, e.t.c	PA	II	5

## Teaching and Learning Activities

A candidate pursuing the course should work in the institution as a full time student. No candidate should be permitted to run a clinic/laboratory/nursing home, while studying postgraduate course. Each year should be taken as a unit for the purpose of calculating attendance.

Every student shall attend teaching and learning activities during each year as prescribed by the department and not absent himself/herself from work without valid reasons.

A list of teaching and learning activities designed to facilitate students acquire essential knowledge and skills outlined is given below.

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.
  - a. **Didactic Lectures:** Recommended for selected common topics for postgraduate students of all specialities. Few topics are suggested as examples:
    - i. Bio-statistics.

- ii. Use of library
- iii. Medical code of Conduct and Medical Ethics.
- iv. National health and Disease Control Programs.
- v. Communication Skills etc.
- vi. Initial introductory lectures about the subject.

These topics may preferably taken up in the first few weeks of the 1<sup>st</sup> year.

- b. **Integrated Lectures:** These are recommended to be taken by multidisciplinary teams for selected topics, e.g. jaundice, diabetes mellitus, thyroid etc.

**2. Journal Club:** Recommended to be held once a week. All the PG students are expected to attend and actively participate in discussion and enter relevant details in the logbook. Further, every candidate must make a presentation from the allotted journal(s) of selected articles at least four times a year and a total of 8 presentations in two years. The presentations would be evaluated using checklists and would carry weightage for internal assessment (See checklist in chapter IV). A time table with names of the students and the moderator should be announced at the beginning of every year.

**3. Subject seminar:** Recommended to be held once a week. All the PG students are expected to attend and actively participate in discussion and enter relevant details in the logbook. Further, every candidate must present on selected topics, at least four times a year and a total of 8 seminar presentations in two years. The presentations would be evaluated using checklists and would carry weightage for internal assessment (See checklist in chapter IV). A timetable for the subject, with names of the student and the moderator should be scheduled at the beginning of every year.

**4. Student Symposium: Recommended as an optional multidisciplinary programme.** The evaluation may be similar to that described for subject seminar.

**5. Ward Rounds:** May be service rounds or teaching rounds.

- a. **Service Rounds:** Postgraduate students should do ward rounds every day.
  - i. For preanaesthetic evaluation of the patients posted for operation.
  - ii. And to do the postanaesthetic follow up of operated patients for alleviation of post-operative pain, fluid management and for diagnosis and management of any of the post-operative sequelae.
- b. **Teaching Rounds:** Every unit should have grand rounds for teaching clinical methods and preanaesthetic evaluation.

Entries of (a) and (b) should be made in the logbook

**6. Mortality & Morbidity Meetings:** Recommended once a month for all postgraduate students. Presentation be done by rotation and by the students who had conducted/assisted anaesthetic management.

- 7. Continuing Medical Education Programmes (CME):** At least 2 state / national level CME programmes should be attended by each student in 2 years.
- 8. Conferences:** Attending conferences is optional. However participation & presentation of scientific paper is mandatory in 2 national ,zonal, state conferences)
- 9. Group discussion-Students are grouped into a batch of 20 and topic is assigned** for discussion which is moderated by a panel of faculties.
- 10. Case presentation-**Clinical case presentation is held once in 15 days where in a post graduate presents detailed history ,examination and anaesthetic management which will be discussed by a panel of discussion.
- 11. Bedside clinics or teaching-**Discussion of anaesthetic management and relevant clinical material will be carried out on a daily basis.

### Rotation and Posting in other departments

The listed knowledge and skills are to be learnt over a period of 2 years. The process is a continuous one. However the recommended period and timing of training in basic sciences, allied departments and speciality departments are given below. The total duration of postings in allied and sub specialities will be 8 months and the remaining 1 year and 4 months in the parent department.

**Basic Sciences:** Rotation in other departments like, Anatomy, to be done as concurrent studies during the first year of training. At least two hours may be spent in the first six months of the course. Basic science relevant to anaesthesia can be studied in the respective departments in the afternoons.

**Anatomy:** Special emphasis for the dissection of larynx, trachea, heart, various nerves & plexuses.

**Allied Speciality:** Students should be posted in ICU, ICCU, SICU (Trauma unit) and pain clinic during second year of training for 2 weeks in each, for a total duration of 2 months.

### Other Subspecialities of Anaesthesia:

Postings to other subspecialty departments will be, during second year and the duration of postings is as shown below:

Pain clinic	4 weeks
Cardiothoracic surgery	weeks 4
Neuro surgery	weeks 4
Paediatric surgery	weeks 2
Cancer surgery	weeks 2
Oromaxillofacial surgery	weeks 2
Plastic surgery	weeks 2
Urology	weeks 2
Laposcopic and endoscopic surgery	weeks 2

Anaesthesia for investigative procedures like CT scan, lithotripsy, cardiac Cath lab	weeks 2
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## Year wise Structured Training Schedule

### First Year:

1. Basic Sciences related to anaesthesiology: theoretical knowledge, frequent visits to anatomy dissection halls & museum, to revise the relevant subjects.
2. Theoretical knowledge of anaesthesiology & resuscitation: special emphasis on clinical examination of patients, learning clinical methods, arriving at correct diagnosis.
3. Basic knowledge about
  - a. Computers in anaesthesia, Medline, Internet.
  - b. Bio statistics.
  - c. Medical audit.
  - d. Medicolegal aspects.
  - e. Evidence based medicine.
  - f. Medical ethics and social responsibilities of anesthesiologists.
4. Learning of communication skills.
5. Anaesthesia Skills
  - a. Preanaesthetic evaluation / under supervision.
  - b. Monitoring of patients throughout perioperative period.
  - c. Assisting, setting up of anaesthesia machine, monitors and ventilator.
  - d. Assisting the conduct of anaesthesia for major surgeries; knowledge about the complications of anaesthesia.
  - e. Assisting for short anaesthesia initially and later on doing independently under supervision
  - f. Conduct of anaesthesia OPD.
  - g. CPR training and mastering of BLS & ACLS.
  - h. Soft skills development.

### Second Year:

1. Theoretical knowledge of allied subjects, subspecialties of anaesthesia. Assisting senior anaesthesiologists in specialised branches like paediatric surgery, cardiothoracic surgery, critical care trauma etc.
2. Anaesthetic Skills: At the end of second year the student should be capable of;
  - a. Anaesthetising patients without assistance but under supervision.
  - b. Identifying the complications of anaesthesia and manage them independently but under supervision.
  - c. Setting up of anaesthesia machines, monitors and ventilator

independently.

3. Conference & Workshops: Attending one state level and one national level conference/CME and presentation of a scientific paper.
4. The student should be actively involved in presentation of seminars, journal clubs, case presentation/discussions.
5. The student should be well versed with basics, allied subjects and recent advances in the respective fields.
6. Anaesthesia Skills: At the end of the second year the candidate should be able to make independent decisions as regards anaesthesia, pain management and post-operative care of all kinds of patients.
7. The student must get expertise in the specialised procedures as noted in the course content table.

### **Monitoring Learning Progress**

It is essential to monitor the learning progress of each candidate through continuous appraisal and regular assessment. It not only also helps teachers to evaluate students, but also students to evaluate themselves. The monitoring shall be done by the staff of the department based on participation of students in various teaching / learning activities. It may be structured and assessment be done using checklists that assess various aspects. Checklists are given in Chapter IV.

The learning outcomes to be assessed should include:

1. Personal attitudes
2. Acquisition of knowledge
3. Clinical and operative skills

#### **1. Personal Attitudes:** The essential items are:

- a. Caring attitude
- b. Initiative
- c. Organizational ability
- d. Potential to cope with stressful situations and undertake responsibility.
- e. Trustworthiness honesty and reliability.
- f. To understand and communicate intelligibly with patients and others.
- g. To behave in a manner which establishes professional relationships with patients colleagues, superiors and subordinates.
- h. Ability to work in a team.
- i. A critical enquiring approach to the acquisition of knowledge.

The methods used mainly consist of observation. It is appreciated that these items require a degree of subjective assessment by the guide, supervisors and peers.

**2. Acquisition of knowledge:** The methods used comprise of 'Log Book' which records participation in various teaching / learning activities by the students. The number of activities attended and the number in which presentations are made are to be recorded. The log book should periodically be validated by the supervisors. Some of the activities are listed. The list is not complete. Institutions may include additional activities, if so, desired.

- a. **Journal review meeting (Journal Club):** The ability to do literature search, in depth study, presentation skills, and use of audio – visual aids are to be assessed. The assessment is made by faculty members and peers attending the meeting using a checklist (see Model Checklist – I, Chapter IV)

- b. **Seminars / Symposia:** The topics should be assigned to the student well in advance to facilitate in depth study. The ability to do literature search, in depth study, presentation skills and use of audio – visual aids are to be assessed using a checklist (see Model Checklist II, Chapter IV)
- c. **Integrated Teaching:** This should be a multidisciplinary case study of an interesting case to train the candidate to solve diagnostic and therapeutic problems by using an analytical approach. The presentation(s) are to be assessed using a checklist similar to that used for seminar.

### 3. Clinical Skills:

- a. **Day to Day work:** Skills in outpatient and ward work should be assessed periodically. The assessment should include the candidate's sincerity and punctuality, analytical ability and communication skills (see Model Checklist III, Chapter IV)
- b. **Clinical Meeting:** Candidates should periodically present cases to his peers and faculty members. This should be assessed using a check list (see Model Checklist IV, Chapter IV)
- c. **Clinical and Procedural skills:** The candidate should be given graded responsibility to enable learning by apprenticeship. The performance is assessed by the guide by direct observation. Particulars are recorded by the student in the log book. (Table No. 3, Chapter IV)

**4. Periodic tests:** The department may conduct two tests, one at the end of first year and the other in the second year, three months before the final examination. The tests may include written papers, practical / clinical and viva voce.

**5. Work diary / Log Book:** Every candidate shall maintain a work diary and record his/her participation in the training programmes conducted by the department such as journal reviews, seminars, etc. Special mention may be made of the presentations by the candidate as well as details of clinical or laboratory procedures, if any conducted by the candidate.

**6. Records:** Records, log books and marks obtained in tests will be maintained by the Head of the Department and will be made available to the Deemed to be University or MCI.

### Log Book

The log book is a record of the important activities of the candidates during his training. Internal assessment should be based on the evaluation of the log book. Collectively, log books are a tool for the evaluation of the training programme of the institution by external agencies. The record includes academic activities as well as the presentations and procedures carried out by the candidate.

**Format for the log book** for the different activities is given in Tables 1, 2 and 3 of Chapter IV. Copies may be made and used by the institutions.

**Procedure for defaulters:** Every department should have a committee to review such situations. The defaulting candidate is counseled by the guide and head of the department. In extreme cases of default the departmental committee may recommend that defaulting candidate be withheld from appearing the examination, if she/he fails to fulfill the requirements in spite of being given adequate chances to set himself or herself right.

## **Scheme of Examination**

- a. **Theory:** Written examination shall consist of three question papers, each of three hours duration. Each paper shall consist of two long questions carrying 20 marks each 3 short essay questions each carrying 10 marks, 6 short answers each carrying 5 marks. Total marks for each paper will be 100. Questions on recent advances to be asked in any or all the papers. Distribution of topics for each paper will be as follows:

### **Paper I: Basic Science as applicable to anaesthesia.**

1. Basic sciences–Applied anatomy, physiology, biochemistry, pharmacology & pathology
2. Equipments–Anaesthesia modern work stations & Boyle's machine, breathing circuits, drug delivery systems, vaporizers, miscellaneous (patient monitoring)

### **Paper II: Clinical Practice of anaesthesia**

1. CVS
2. RS
3. RENAL
4. GASTROINTESTINAL SYSTEM
5. PAEDIATRICS
6. OBG
7. ENDOCRINE & Obesity
8. ORTHOPAEDICS
9. DENTAL ANAESTHESIA
10. RECENT ADVANCES

### **Paper III: Clinical Practice of anaesthesia.**

1. Anaesthesia for organ procurement & transplantation
2. Recent advances
3. Critical care and PACU
4. Pain medicine
5. Day care surgeries
6. Geriatrics
7. Hematology
8. ENT & OPHTHALMOLOGY
9. plastic surgery
10. Neuro & Trauma
11. brain death
12. Disaster management
13. Patient care in extreme environment.
14. Lasers & Anaesthesia for robotic surgeries.

### **Clinical Examination:**

**150 marks**

Each candidate shall appear for the clinical examination where in clinical skills & competence of candidates under taking independent work as a specialist will be scrutinized. Each candidate should examine one long case (80 marks) and two short cases (35 marks each) which may include pain & critical care cases.

### **Viva-Voce:**

**50 marks**



Viva-Voce examination shall aim at assessing depth of knowledge, logical reasoning, confidence and oral communication skills. The total marks shall be 50 and the distribution of marks shall be as under:

For examination of all components of syllabu

**50 marks**

All examiners will conduct viva-voce conjointly on candidate's comprehension, analytical approach expression and interpretation of data. It includes all components of course contents. In addition the candidate may also be given, instruments/equipments, X-ray images, ABG reports, ECG strips, drugs ultrasound/echocardiography reports & specimens.

<b>Maximum marks for</b>	<b>Theory</b>	<b>Practical</b>	<b>Viva</b>	<b>Grand Total</b>
Diploma in Anaesthesiology	300	150	50	500

### **Recommended Books and Journals**

#### **Books:**

1. Practice of Anaesthesiology - Wylie - Churchill - Davidson 7th edition
2. General Anesthesia - Prys Roberts 5th edition
3. Anaesthesia - Two volumes, Ronald D, Miller 8th edition.
4. Anatomy for Anaesthetist - Harold Eillis 9th edition
5. Understanding Anaesthetic Equipments - Dorsch & Dorsch 5th edition.
6. Emergency Anaesthesia - Thornton 2nd edition
7. Principles of Obstetric - Anaesthesia - J. S. Crawford 4th edition.
8. Physics for Anaesthetist - Muschnin & Macintosh.
9. Neurosurgical Anaesthesia - Hunter
10. Paediatric Anaesthesia - Gregory.
11. Cardiac Anaesthesiology - 2 volumes - Jonathan Benumaf.
12. Anaesthesia and co existing diseases - Stoelting.
13. Anaesthesia Equipment - Ehrenwerth and James. B. Eiscnkraft
14. Text Book of Anaesthesia - A. R. Aitken Head & G. Smith
15. Anaesthesia for infants and children - Smith
16. Obstetrics Anaesthesia - Bonica
17. Regional Anaesthesia - Macintosh series
18. Epidural Analgesia - Bromage
19. Medical problems of Anaesthesia - Kaulman
20. Principles of Anaesthesiology - Collins
21. Anaesthesia for Orthopedic Surgery - Zauder and others
22. Neural Blockade - Cousins
23. Cardiac Anaesthesia - Kaplan
24. Thoracic Anaesthesia - Kaplan and Muschin
25. Regional Anaesthesia - Labot
26. Drugs Interactions & other basic Medical science - Anaesthesia speciality books.
27. Anaesthesia for uncommon diseases - benumof
28. Text book of physiology & pharmacology
29. Morgan 5th edition
30. Lee's synopsis of anaesthesia
31. Barash 7th edition
32. Ward equipment 6th edition
33. Yao & Artusio 7th edition

### 34.34.Snieder-obstetric anaesthesia.

#### Journals

1. Anesthesia and Analgesia
2. Anaesthesiology
3. Anaesthesia I
4. Acta Anaesthesia Scandinavica
5. Canadian Journal of Anaesthesia
6. Indian Journal of Anaesthesiology
7. British Journal of Anaesthesia
8. Expert Anaesthesia
9. Recent advances in Anaesthesiology
10. Year Book of Anaesthesia
11. Anesthesia Clinics
12. Clinics in North America in Anaesthesiology
13. Journal of anaesthesiology and clinical pharmacology
14. European journal of anaesthesiology
15. Regional anaesthesia & pain medicine.

**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, haematological, and immune systems, pregnancy related diseases, 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, Disease related to dysfunction of hepatobiliary, Muscular, Connective Tissues and Immune system, management of perioperative Infection, neuromuscular Disorders, poisoning, Respiratory/ Cardiac Arrest 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 and other relevant equipment including physical principles involved in their construction and functioning.
- F. Perioperative Anaesthesia** management including pre-operative evalua-

tion, intraoperative management as well as postoperative 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 and 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 and Peripheral Nerve blocks) 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 renal transplant.
- Gynaecology and Obstetrics
- ENT and Head and Neck
- Orthopaedics
- Ophthalmology
- Paediatric and Neonate: Differences between adult and paediatric Anatomy, Physiology, Pharmacology, Anaesthesia principles, paediatric / neonatal emergencies, postoperative care, fluid and ventilator management.
- Cardiac, Vascular and Thoracic: Conduct of closed heart as well as open heart surgeries (Valvular, Ischemic, Congenital – Cyanotic and 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., other open urological procedures like pyeloplasty, urethroplasty, 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, cosmetic surgeries etc.
- Dental: Monitored Anaesthesia Care, anaesthetic management of pedodontia patients, maxillofacial surgeries including TMJ Ankylosis, Awake, Retrograde and Fibre optic 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, appendectomy, cholecystectomy, nephrectomy and other major procedures in gastro, uro, onco and paediatric lap surgeries.
- Anaesthesia for various diagnostic, therapeutic, and specialized procedures
- Anaesthesia for Geriatric patients
- Anaesthesia for surgery using LASER

- Anaesthesia / Sedation techniques outside operating room : Electroconvulsive shock therapy (ECT), Electrophysiological 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, endoscopy room procedures like ERCP, balloon dilatation, etc.

## **H. History of Anaesthesia**

- Airway Management: Assessment of difficult airway, Awake, Retrograde, Use of intubating LMAs, Intubating Stylets, Various laryngoscopes designated for difficult airway, insertion of combitube, ability to perform cricothyrotomy and use of Venturi, Minitrach, fiberoptics intubations, and use of video laryngoscopes.
- Basic and Advanced Cardiopulmonary and Cerebral Resuscitation (CPCR) for all age groups for patients under different situations e.g., neonates, pregnant females, poisoning cases, trauma victims etc.
- Acid base and fluid management including use of crystalloids, colloids, blood and 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 uses, maintenance, sterilisation and care
- Medical gases: knowledge of manufacturing, storage and central pipeline systems
- Day Care/Outpatient Anaesthesia
- Remote Location Anaesthesia: Anaesthesia practice during disasters and for large turnover surgeries in camps/ mass casualties.
- Emergency Anaesthesia
- Monitored Anaesthesia Care
- Labour Analgesia
- Pain Relief – Acute and Chronic
- Critical Care practice including oxygen therapy, respiratory therapy, ventilator support, haemodynamic monitoring, prevention and management of multi organ failure, and care of patients with brain damage and brain dead patients for organ transplant
- Advanced Trauma life support (ATLS)
- Occupational hazards
- Safety in Anaesthesia
- Complications of Anaesthetic procedures, its prevention, detection and management.
- Record Keeping in Anaesthesia
- Medial Audit
- Quality Assurance
- Anaesthesia Standards: e.g. Minimum monitoring standard
- Medicolegal aspects in Anaesthesia
- Ethics in Anaesthesia
- Principles of evidence Based Medicine
- Basic Research Methodology and Clinical Trials
- Bio-statistics
- Computers: Utility, computer assisted learning and data storage, computerized anaesthesia records.
- Skills: for planning of operation theatre, pain clinic, recovery room, intensive care etc., including selection and purchase of equipments.





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