# College of Physicians and Surgeons of Mumbai

## Syllabus for CPS-PG-Course

## DA-DIPLOMA IN ANAESTHESIA

**College of Physicians and Surgeons of Mumbai**

**CPS House, Dr. E. Borges Marg, Parel, Mumbai – 400012.**

# DA-DIPLOMA IN ANAESTHESIA

## OBJECTIVES:

1. To give sufficient understanding of basic sciences related to the specialty viz. Anatomy, Physiology, biochemistry, pathology, microbiology, pharmacology, forensic medicine, preventive aspects and statistics.
2. Diagnose and manage majority of conditions related to the specialty – Viz. Medicine, Surgery and Obstetrics-Gynaecology.
3. Pharmacology in detail of Anaesthetics and adjuvant drugs as well other drugs for interaction.
4. Preoperative assessment and preparation and post-operative care.
5. Extensive knowledge of instruments, physics and techniques of general, regional and local Anaesthesia.
6. Adequete communication skills to perform the duties effectively, especially communication with colleagues, patients and relatives.

## COURSE DESCRIPTION

**Eligibility:** A candidate should possess MBBS degree/ equivalent degree as per provisions of Indian Medical Council Act.

**Duration:** 2 Years

**At the end of the course, every student should acquire following knowledge (including higher cognitive) and skills**

**A. Cognitive domain**

1. Knowledge of Anatomy related to;

   Upper and lower respiratory tract including lungs, pleural cavity, Diaphragm, heart and coronary circulation, pericardium, peripheral vessels, central vessels, mediastinum,
2. Foetal circulation and relevant anatomy in foetal circulation.
3. Surface markings for major vessels, nerves etc, especially required for intramuscular, intrathecal, intravenous, spinal injections; arterial and venous cannulations and regional anaesthesia – nerve block, field block, central neuraxial blockade etc
4. Patient positioning under anaesthesia
5. Physiology of various systems especially

Cardiovascular, Respiratory, endocrine, CNS, sympathetic and parasympathetic, neural pathways, hepatobiliary, renal, haematological, neuromuscular, regulation of temperature and metabolism, stress response etc

6. Biochemistry relevant to electrolyte balance, fluid balance, peri-operative fluid therapy, acid base homeostasis.
7. Pathological states affecting the respiratory system, cardiovascular system, CNS etc in relation to the drugs used in anaesthesiology.
8. Knowledge of commonly used drugs in anaesthesia practice like drugs for premedication, inducting agents - intra-venous and inhalational, neuromuscular blocking agents and reversal of muscle relaxants
9. General principles, concepts of pharmacokinetics and pharmacodynamics, drug interactions, drug reactions.
10. Understanding of principals of sterilization, infection control and preventive measures for contamination.
11. Knowledge of important microbes, especially in relation to nosocomial infections
12. Knowledge about disposal of biomedical waste generated in OT / ICU.
13. General principles and practices in OT
14. Knowledge of various equipments used for anaesthesia, their principals and laws of physics governing their functions.
15. Acts and regulations of medical importance including CPA, organ transplant act etc
16. Knowledge of consent, informed consent, medical ethics, doctor-patient relationship
17. Council norms and guidelines in relation
18. Knowledge of common ailments and their importance in the anaesthesia
19. Knowledge of basic principles of pre-aesthetic assessment
20. Knowledge about the grades of anaesthesia and their applied aspects
21. Knowledge of interpretation of ECG, laboratory investigations for planning and delivery of anaesthesia.
22. Knowledge of basic life support, advanced cardiac life support,
23. Knowledge of Neonatal resuscitation
24. History of anaesthesia
25. Knowledge of principles of artificial ventilation and various protocols related to Intensive Care Unit.
26. Detailed knowledge about various drugs used in anaesthesia, route of administration, their pharmacology, pharmacokinetics, mode of action, side effects, drug interaction, doses in

various physiological and pathological conditions, indications and contraindications, treatment in overdose, addictive probabilities and de-addiction.

27. Detailed Knowledge about intra operative anaesthesia management, identification of emergencies / complications and detailed knowledge about their management.
28. Knowledge about special precautions to be taken preoperatively, intra-operatively and post-operatively in relation to a particular patient, specific to his / her physiological / pathological condition.
29. General principles of post-operative care
30. Identification of emergencies and postoperative complications.
31. Knowledge of acute and chronic pain management,
32. Knowledge of non-conventional methods like nerve block etc.
33. Knowledge of use of blood and blood components pre-operatively, intra-operatively or post operatively.
34. Knowledge of identification and management of various types of shock
35. Knowledge about anaesthesia in special circumstances like disasters
36. Anaesthesia in rural and difficult areas
37. Knowledge about various components of CSSD, procedures to be followed in the CSSD and management of an effective central sterilisation department.

**B. Affective Domain:**

1. Should develop communication skills to interact effectively with patients, relatives and colleagues and other hospital staff.
2. Should always adopt ethical principles and practices
3. Should be able to work a member of a team for effective care delivery system
4. Should develop an attitude to contribute effectively in the improvement, maintenance of health care delivery system of the country and to contribute in improving the health indicators of our country in comparison with the other developed world.

**C. Psychomotor domain**

**Following skills should be acquired**

1. Preoperative evaluation / assessment of patient and correct identification of any physiological / pathological condition.
2. Ability to identify required investigations to be done peri-operatively for assessment, and to interpret their results.
3. Assessment of risk of procedure.

4. Explaining the information in preoperative evaluation and outcome enhancement and
5. communication skill to patients and relatives.
6. Pre-operative selection of drugs, Preparation of work table etc.
7. Identify conditions like difficult airway by following difficult airway algorithms.
8. Demonstrate management of a Failed intubation drill
9. Demonstrate ability to monitor and assess depth of anaesthesia
10. Demonstrate mastery in common procedures like venepuncture, lumbar puncture, intubation, use of invasive and non-invasive monitoring equipments, management of appropriate mechanical ventilation etc
11. Demonstrate abilities to manage body fluid composition; volume status; replacement of fluid and blood loss;
12. Use of whole blood and blood components.
13. Demonstrate abilities to manage electrolyte and acid base derangements; osmolarity and osmolality.
14. Demonstrate acquisition of skills to initiate mechanical ventilation; select appropriate type and mode of ventilator; and monitor proper functioning of ventilator.
15. Identify any of the complications intra operatively and effective management of the same.
16. Identify the need to perform intra-operative laboratory tests, blood gases, coagulation profile and interpret the results with clinical correlation
17. Cannulation of arteries, central and peripheral veins.
18. Demonstrate ability in using and interpreting the routine non-invasive and invasive monitors intra-operatively: Pulse oximeter, ECG, BP, capnograph, Central venous pressure etc
19. Demonstrate skills in providing basic life support, advanced cardiac life support,
20. Demonstrate ability to administer general anaesthesia, spinal anaesthesia, regional anaesthesia etc
21. Demonstrate ability to give extradural block (EDB) lumbar and thoracic, Spinal Block, and Peripheral Nerve Blocks.
22. Ability to perform effectively during disasters, mass casualty etc.
23. Manage emergencies like foreign body in airway, rapidly progressing spinal compression, massive haemoptysis and lobectomy,
24. Management of intra-operative shock, cardiac arrest, bronchospasm or any other complication.
25. Management of anaphylaxis

26. Ability to identify and manage commonly occurring post operative problems, in OT as well as in recovery room.
27. Assess patient recovery and the parameters for transfer to the ward / ICU.

Demonstration of following abilities in **Intensive Care Unit**

1. Recognizing the critically ill patient who needs intensive care
2. Practicing infection control practices and control of nosocomial infections.
3. Inserting central venous lines, arterial lines using ultrasound and interpreting the data.
4. Managing cardiovascular instability, respiratory failure and postoperative pulmonary complications
5. Ability to use various ventilators, monitors and other instruments in the ICU.
6. Ability to identify and manage life threatening conditions or complication of any disease or procedures in ICU.

Demonstration of following abilities in **Acute and Chronic Pain Management**

1. Practice the different modalities of physical therapy that may relieve both acute and
2. chronic pain
3. Practice the acute pain, cancer pain guidelines and WHO treatment ladder.
4. Management of regional blockade
5. Pain control in burns patients. Pain control in trauma patients

Demonstration of abilities to manage **Chronic Pain :**

6. Lumbar sympathectomy, stellate ganglion block, celiac plexus block , infraorbital nerve block, intercostals nerve block etc
7. Practice principles of management of cancer pain, principle of management of noncancer
8. neuropathic pain
9. Indications for stimulation techniques such as dorsal column stimulation, and deep brain stimulation.
10. Awareness of the basic principles of palliative care.

**Demonstrate practice of Regional Anaesthesia**

All peripheral nerve blocks of the upper and lower limbs.

Brachial plexus, cervical plexus, lumbar plexus, stellate ganglion block, Sciatic nerve block, Femoral nerve block, Wrist block, Popliteal Nerve block, Trigeminal nerve block, Retro bulbar blocks, Paravertebral blocks, Caudal block – adult and pediatric, Ankle block, Epidural block/Catheter, Subarachnoid block, Bier's block,

**Demonstrate practice of Anaesthesia in special circumstances or patients**

**Pediatrics anesthesia-**

**Demonstrate practice of Anaesthesia in special circumstances or patients**

**Pediatrics anesthesia-**

Ability to give anaesthesia to paediatric patients with special reference to relevant changes in anatomy, physiology, pharmacology, drug doses and interactions in pediatric age group.

Airway management, instruments and equipments, ventilators, laryngoscopes etc used in paediatric anesthesia.

Congenital conditions and anesthesia.

Complications like hypothermia, hyperthermia, convulsions, etc. and its management.

Emotional and behavioural problems affecting the practice of anaesthesia.

Anaesthesia in Low birth weight babies, Premature babies,

Small for date babies.

Malnourished child and anaesthesia.

Anaesthesia in neonatal intensive care unit.

Blood components in pediatric age group.

Medico-legal issues in the paediatric anaesthesia.

Management of post anaesthesia complications like apnea, laryngospasm, electrolyte disturbances hypothermia, hyperthermia, convulsions, severe vomiting and bleedings.

**Neuroanaesthesia**

Application of basic knowledge of anatomy of central nervous system, cerebral circulation and intra cranial pressure and its implications

Application of basic understanding of blood brain barrier, CSF circulation etc

Anesthesia to patients with neurologic disease disorder

Role of sympathetic and parasympathetic nervous system disorders in anaesthesia

Cranial nerve anatomy and their role in anaesthesia

Anaesthesia to patients with head injury requiring anaesthesia.

Application of basic concepts behind electrophysiologic monitoring of the brain

and spinal cord.

Positioning the patient for surgery and the advantages and disadvantages of each position.

Anaesthesia and electroencephalogram (EEG) , evoked potentials.

Differential diagnoses and treatment alternatives of intraoperative intracranial

hypertension (“tight brain”)

Monitoring: techniques for detection and management of air embolism.

Lumbar puncture and CSF drainage.

Non-surgical management of the head trauma patient, Systemic complications of severe brain injury.

Management of subarachnoid haemorrhage and vasospasm.

Diagnosis and management of patients with brainstem death;

Organ donation

Medico-legal issues with brain dead patients

**The following are special procedures which the post graduate student must be able to perform:**

1. Venepuncture
2. Central line insertion
3. CVP monitoring
4. Pleural tube insertion
5. Catheterisation
6. Intubations
7. Blind Nasal intubation
8. Failed intubation drill (includes Fiberoptic Laryngo/ Bronchoscope)
9. Double Lumen Tube
10. Jet Ventilation
11. Suctioning
12. Intubation in Neonates
13. Initiation and management of ventilation
14. Spinal / Epidural
15. Intravenous Regional Anaesthesia
16. Peripheral nerve blocks
17. Brachial Plexus Block
18. Cervical block -Superficial and Deep, Stellate, Splanchnic
19. Radial and Femoral Artery cannulation
20. Neuro-muscular transmission Monitoring
21. Anaesthetic Depth eg. BIS monitoring
22. Use of Use machine for nerve block

**SYLLABUS**

**(A)** **Anatomy** of cranial nerves, respiratory tract including, nose, larynx, broncho-pulmonary segment, heart, vessels, diaphragm, triangles of the neck, tongue. Dermatomes and cutaneous innervations of extremities. Spine and contents. Cerebral circulation and ventricles.

**(B)** **Physiology**: Respiratory, cardiovascular, hepatobiliary, renal and endocrinal system; Central nervous system. Blood groups, muscle and neuromuscular junctions, E.C.G., regulation of temperature and metabolism. Stress response, cerebral blood flow and intracranial pressure (ICP).Pathophysiology of shock, pulmonary function tests and application.

**(C)** **Biochemistry:** Fluid & electrolyte balance. Blood, blood products and transfusion. Enzymes, calorie requirement, parenteral nutrition. Acid-base homeostasis. Interpretation of blood gases and other relevant biochemicalvalues.

**(D)** **Pharmacology**

1. General principles, pharmacokinetics andpharmacy-dynamics.
2. Inhalational, intravenous anaesthetics, drugs used in pre-medication,Post-operative pain, neuro-muscular blocking drugs. Autonomic Drugs, vasopressin andvasodilators.
3. Drugsusedindifferentdiseases.DrugInteractionsDrugsissuedinspinal,epiduralandlocal Anaesthesia.

**(E)** **Basic physics in anaesthetic equipments and techniques.**

1. Gas laws, vaporization and vaporizers.
2. Anaesthesia machine, assembly and checking
3. Air way equipent, tracheotomy, LMA, fiberoptic Laryngoscopes, combitube and other devices.
4. Breathing systems.
5. Monitoring in anaesthesia,oximetry, cartography, neuromuscular monitoring, temperature and others.
6. Safety devices, medical gases, pipelines,cylinders.
7. Maintenance and sterilization of equipments.

8. Resuscitation of patients after cardiac arrest (CPCR), hyperthermia, hypothermia, Polytrauma, neonatal resuscitation.
9. Artificial ventilation, ventilators and care of patients on ventilators.
10. Oxygen therapy.
11. Post Anaesthesia care (PACU) and ICU.
12. Computers in anaesthesia –
13. E.C.G., X-rays, ultra sound, MRI and CT scan.
14. Pre-operative Assessment and pre-medication
15. Patho-physiology of pain – acute and chronic and management.
16. Paediatric and neonatal anaesthesia, E.N.T., Obstetric anaesthesia and analgesia, plastic, dental, radio diagnosis and radio-therapeutic, procedures, orthopaedic, geriatrics principles of regional anaesthesia.
17. Common and uncommon diseases and anaesthesia.
18. Anaesthesia in difficult situations and environment E.C.T.S., outpatient anaesthesia.
19. Principles of management in cardiac, neuro thoracic, vascular, transplantation and burns.
20. Management of complications – respiratory failure, cardiac failure, Coagulation disorders.
21. Intensive care – Principles.
22. History of Anaesthesia
23. Medico – legal aspects.

## DA - DIPLOMA IN ANAESTHESIA

## EXAMINATION PATTERN

**Theory Examination:**

| PAPER I | PAPER II | PAPER III |
|---|---|---|
| All Basic Medical Sciences related to Anaesthesiology | Practice of Anaesthesiology and various modes and methods of Anaesthesia Including recent advances. | Recent Advances in Anaesthesiology including management of differentage groups in health and disease. |
| **Section I** | **Section I** | **Section I** |
| Q.1. 10 Marks<br>Q.2. 10 Marks<br>Q.3. 10 Marks<br>Q.4. 10 Marks<br>Q.5. 10 Marks<br>**Total 50 Marks** | Q.1. 10 Marks<br>Q.2. 10 Marks<br>Q.3. 10 Marks<br>Q.4. 10 Marks<br>Q.5. 10 Marks<br>**Total 50 Marks** | Q.1. 10 Marks<br>Q.2. 10 Marks<br>Q.3. 10 Marks<br>Q.4. 10 Marks<br>Q.5. 10 Marks<br>**Total 50 Marks** |
| **Section II** | **Section II** | **Section II** |
| Q.6. 10 Marks<br>Q.7. 10 Marks<br>Q.8. 10 Marks<br>Q.9. 10 Marks<br>Q.10. 10 Marks<br>**Total 50 Marks** | Q.6. 10 Marks<br>Q.7. 10 Marks<br>Q.8. 10 Marks<br>Q.9. 10 Marks<br>Q.10. 10 Marks<br>**Total 50 Marks** | Q.6. 10 Marks<br>Q.7. 10 Marks<br>Q.8. 10 Marks<br>Q.9. 10 Marks<br>Q.10. 10 Marks<br>**Total 50 Marks** |
| Section I + II = 100 Marks | Section I + II = 100 Marks | Section I + II = 100 Marks |
| **Total Theory = 300 Marks, Passing = 150 (i.e. 50%) Marks in aggregate** | | |

| **Practical Examination:** | | **Marks** |
|---|---|---|
| Paper - IV | Clinical in Anesthesiology incl. Medicine & Surgery | 100 |
| Paper - V | Clinical in Anesthesiology incl. Medicine & Surgery | 100 |
| Paper - VI | Instruments and Viva-Voce incl. recent advances | 100 |
| **Total Marks** | **[Passing = 150 (i.e. 50%) Marks in aggregate]** | **300** |