

**Maharashtra University of Health Sciences,  
Nashik**

# **SYLLABUS**

**“Fellowship Course in Gastroenterology  
Anaesthesia”**

## **“Fellowship Course in Gastroenterology Anaesthesia”**

### **Goals of starting Fellowship Course in Gastroenterology Anaesthesia**

1. To produce competent super specialist Gastroenterology Anaesthesiologists and to cater the need of the community.
2. To be aware of contemporary advances and development in the discipline concerned.
3. To practice at secondary and tertiary level of health care delivery system.
4. To provide the expertise with special skills and intensive monitoring in perioperative period for the needy patients in super specialty departments.
5. To provide structured training programme including academic activities in the form of the catered training, lectures, case discussions, journal review and mortality – morbidity meeting and to improve the knowledge and skill in the specialty.

### **Eligibility:**

1. A candidate must possess the degree of MD/DNB (or its equivalent recognized degree) in Anaesthesiology.
2. The candidate should have acquired additional qualification for PG as a medical practitioner according to the rules in force under the MCI or MMC or any other state Medical Council.
3. Any other as laid down by MUHS

### **Selection Criteria for candidates:**

1. Fellows should be selected in a fair and non-discriminatory manner in accordance with the Equal Opportunities. The selection process will be according to MUHS guidelines.

### **Duration of the Course: (Total 1 Year)**

1. Operation Theatre, Endoscopy & post anaesthesia care: 12 months

### **Minimum requirements/infrastructure/clinical case required in the concerned colleges where the course will be started**

1. An institute conducting both undergraduate and postgraduate teaching shall satisfy the minimum requirements for undergraduate training as prescribed by the MCI.
2. Provide facilities consistent with the all round training including training in basic medical sciences and other departments related to the subject of training.
3. Have as many facilities for autopsies, biopsies, and cytology as possible for teaching purposes.
4. The surgical gastroenterology department should have at least 20 beds
5. The surgical gastroenterology / anaesthesiology department should have at least 6 bedded ICU of which 3 beds are for high dependency cases and 2 as recovery.
6. There shall be adequate space and sufficient number of examination cubicles of super specialty clinics.
7. The institute shall have adequate laboratory facilities and shall provide all the investigative facilities required and regularly updated, keeping in view the advancement of knowledge and technology and research requirements for training of students.
8. The college should have excellent central library, departmental library, computer with internet facility and journals (National as well as International)
9. The department shall have adequate number of all equipments including the latest one necessary for training as may be prescribed by the MCI.

### **Suitability of the Course:**

1. To improve the patient care especially in super specialty departments it is need of the time to have skilled expertise in Gastroenterology Anesthesiology.
2. To reduce the morbidity and mortality in perioperative period needs specially trained personnel.

### **Expected learning objectives**

1. On completion, the fellow will be able to provide safe anaesthesia care for patients undergoing routine surgical, diagnostic and therapeutic procedures in gastroenterology procedures.
2. Resuscitate and manage emergencies in gastroenterology
3. Manage the acute pain service
4. Provide critical perioperative care
5. Recent advances in the practice of gastroenterology anaesthesia

## Syllabus

1. **Anatomy:** Gross and applied anatomy of Gastroenterology system (Oesophagus and diaphragmatic hernia, Stomach, Obesity, Small Intestine, Colon, Rectum, Anus, Appendix, Liver, Gall bladder and extra hepatic biliary system, Pancreas, Spleen, Abdominal wall, Omentum, Mesentery, Retroperitoneum)
2. **Physiology:** Physiology of Oesophagus and diaphragmatic hernia, Stomach, Obesity, Small Intestine, Colon, Rectum, Anus, Appendix, Liver, Gall bladder and extra hepatic biliary system, Pancreas, Spleen, Abdominal wall, Omentum, Mesentery, Retroperitoneum, mechanism of transmission of pain in different acute and chronic pain conditions, cardio-respiratory physiology in patients with gastroenterology diseases, and endocrine function of them.
3. **Pharmacology:** This would include drugs affecting the functions of organs of gastroenterology and action of drugs on transmission of different stimuli, including pain, and pharmacology of drugs used in gastroenterology intensive care management.
4. **Monitoring:** This would include indication, technique and interpretation of basic and advanced monitoring devices in gastroenterology anaesthesia.
5. **Fluid-electrolyte and acid - Base disturbance** in general with special emphasis on surgical gastroenterology patients. Management of fluid and electrolyte therapy in various gastroenterological disorders.
6. **Temperature regulation**
7. **Nutritional considerations:** Evaluation of nutrition and complications of nutritional therapies in gastroenterology patients and that requiring prolonged intensive care management.
8. **Principle of airway management:** The type of airway the patient requires, use of different devices, when to intubate, how to maintain the patency of airway for a long period, when to extubate, indications management and complication of tracheostomy.
9. **Principles of ventilatory therapy:** What type of ventilation the patient requires, care of the patient during ventilatory care, prevention and treatment of complications during ventilatory therapy, when and how to wean the patients from ventilator.
10. **Principles of cardiac support:** Care of the arterial pressure, treatment of dysrhythmia, management of different types of heart failure and management of cardiac arrest.
11. **Management of surgical Gastroenterology ICU:** In addition to clinical care of patients, protocols, arrangement of beds, monitoring systems, air-conditioning, administration aspects and infection control.

### Clinical Aspects: Special characteristics of gastroenterology anaesthesia

1. General approach to gastroenterology anaesthesia
2. Preoperative preparation
3. Anaesthesia equipment and monitoring
4. Induction of anaesthesia and endotracheal intubation
5. Positioning and anaesthesia
6. Intra and postoperative management
7. Regulation of fluids and electrolytes including blood and blood products
8. Thermal regulation
9. Blood conservation
10. Pain management
11. ICU management and ventilation
12. Nutrition
13. Anaesthesia and sedation for procedure outside the operating room like endoscopy
14. Clinical management of open and laparoscopic surgical procedures (laparotomy, stoma, resection and anastomosis, fundoplication, abdomino perineal resection, Whipple's procedure, cholecystectomy, hepatectomy, pancreatectomy, splenectomy, porto caval shunt etc)
15. Anaesthesia for organ transplantation (cadaveric and living donor)
16. Anaesthesia for trauma
17. Emergency management especially of patients with full stomach, intestinal obstruction etc
18. Associated systemic problems in Gastroenterology
19. Cardiopulmonary resuscitation

20. Syndromes and their anaesthetic implications
21. Infection control in ICU and operation theatre, sterilization of anaesthetic equipments, monitors, ventilators circuits and intensive care equipments.
22. Recent advances

**Details:**

**Gastroenterology Principles, Knowledge and management of diseases affecting:**

1. Oesophagus and diaphragmatic hernia
2. Stomach
3. Obesity
4. Small Intestine
5. Colon, rectum, anus
6. Appendix
7. Liver
8. Gall bladder and extra hepatic biliary system
9. Pancreas
10. Spleen
11. Abdominal wall, Omentum, Mesentery, Retroperitoneum
12. Laparoscopy

**Goals**

1. Administer anaesthesia safely to patients with gastroenterologic disease who are undergoing surgery, diagnostic procedures requiring anaesthesia, or nonsurgical interventions requiring anaesthesia.
2. Understand the basic concepts of gastroenterologic system physiology as they relate to anaesthesia
3. Know the effect(s) of commonly used anaesthetic agents and adjuvant agents on physiology.
4. Understand the anaesthetic implications of the most common surgical gastroenterological procedures, that is, what is likely to happen during surgery that will affect anaesthetic management.
5. Understand how concurrent medical illnesses affect anaesthesia during surgery.

**Objectives**

1. Review the medical history and physical examination of patients; assess their major problem.
2. Evaluate the other medical problems that may affect anaesthetic care
3. Choose appropriate premedication and agents for anaesthetic induction and maintenance
4. Choose and place the following monitors and monitoring devices for use during surgery: Arterial line, central venous (CVP) or pulmonary artery (PA) pressure catheters by all approaches
5. Assess and perform techniques for awake intubation and positioning of the patient
6. Know general principle of positioning the patient for surgery and the advantages and disadvantages of each position: Lateral, Supine-head turned, lithotomy etc
7. Reverse general anaesthesia rapidly with a minimum of hemodynamic change

**Anesthetic Techniques**

**Knowledge**

1. Understand the pre-operative issues relevant to the anesthetic care including: coexisting morbidities, medications, allergic reactions, labor and delivery history, maternal history, family history, the normal physical exam and the evaluation of abnormal findings.
2. Know the standard guidelines for preoperative fasting
3. Understand the appropriate ordering of preoperative laboratory testing and evaluation.
4. Know the options available for premedication including agents, routes and side-effects.
5. Understand the differences between the various breathing circuits to provide oxygen and anesthesia.
6. Understand the factors determining the speed of inhalation induction in patients and the various agents currently available for inhalation induction including the benefits and side-effects of each.
7. Understand the regulation of temperature in and compensatory mechanisms, effects of anesthesia on temperature and the consequences of hypothermia.

8. Know the differential diagnosis and management of perioperative hyperthermia.
9. Know the fluid and electrolyte requirements including calculation of deficit, intra-operative fluid requirements, glucose requirements and the guidelines, indications and side effects for blood and blood product administration in the patient.
10. Understand the airway and the effects on airway management. Know the oral/nasal airways, facemasks, supra glottic device, blades for laryngoscopy and endotracheal tube sizes (cuffed and uncuffed) and their appropriate use.
11. Know the prevention, management and consequences of laryngospasm.
12. Know the doses of intravenous anesthetic medications including induction agents, opiates, muscle relaxants, reversal agents and emergency medications including side-effects and contraindications.
13. Know the criteria for tracheal extubation and how to perform a deep extubation safely.
14. Know the therapeutic and toxic doses of local anesthetics.
15. Understand the indications and contraindications for spinal and epidural anesthesia and peripheral blocks plus side effects and complications.
16. Understand the post-operative anesthetic complications for patients including stridor, croup, nausea/vomiting and emergence delirium and their management.

### **Skills**

1. Perform appropriate preoperative evaluation.
2. Obtain informed consent.
3. Administer premedication
4. Use appropriate monitoring for an anesthetic.
5. Perform inhalation inductions on patients of all ages.
6. Monitor patient temperature and perform warming methods
7. Appropriately choose and administer fluids to patients. Calculate allowable blood loss.
8. Demonstrate the ability to estimate blood loss in patients.
9. Perform mask ventilation, supra glottic device placement and intubation on patients.
10. Appropriately manage upper airway obstruction, laryngospasm, and bronchospasm in patients.
11. Perform commonly used regional analgesic techniques in patients
12. Develop the ability to choose appropriately between endotracheal intubation, supra glottic device, or facemask ventilation for any surgical procedures.
13. Be able to place an intravenous, peripheral / central catheter patient.
14. Develop the ability to appropriately manage intraoperative hypoxemia.
15. Develop the ability to appropriately manage intraoperative hypocarbia or hypercarbia.
16. Develop the ability to appropriately manage intraoperative hypotension or hypertension.
17. Develop the ability to appropriately manage intraoperative bradycardia or tachycardia.

### **Pain Management**

#### **Knowledge**

1. Understand methods for recognition and assessment of pain.
2. Know methods for treatment of acute postoperative pain.
3. Understand the different opioid analgesics.
4. Know different regimens for postoperative epidural analgesia.
5. Understand the pathophysiology and treatment of common chronic painful conditions (e.g., sickle cell disease, oncologic disease, reflex sympathetic dystrophy, etc.)

#### **Skills**

1. Demonstrate the ability to develop and carry out a plan to manage and treat postoperative pain.
2. Demonstrate the ability to treat refractory postoperative pain
3. Be able to evaluate and treat common complications of analgesic (e.g., nausea, vomiting, pruritus, and ventilatory depression).
4. Be able to evaluate and manage with epidural analgesic therapy and break-through pain.
5. Be able to evaluate for the use of patient-controlled analgesia (PCA), and demonstrate appropriate ordering of PCA.

## Medicolegal aspects

### Summary

1. Scientific basis of anaesthesia
2. Preoperative assessment and preparation
3. Standard equipment, techniques and monitoring
4. Airway management
5. Venous access
6. Resuscitation
7. Difficult circulations and ventilation
8. Major hazards
9. Pain management including regional techniques
10. Congenital and inherited diseases
11. Haematology and oncology including blood transfusion
12. Laparoscopic surgery
13. Sedation and anaesthesia outside theatres

### Books recommended

1. Anesthesia, Ronald Miller
2. Wylie and Churchill Davidson's-a practice of anaesthesia Thomas E. J. Healy
3. Anaesthesia and co-existing disease. Robert Stoelting, Stephen Dierdoff
4. Anaesthesia and uncommon diseases. Joseph Benumof
5. Management of patient for radical cancer surgery. William Rowland, Olga Sschweizer
6. The liver and anaesthesia William Mushin
7. Understanding anaesthesia equipments Dorsch and Dorsch
8. Anaesthesia in laparoscopic surgery. Jayashree Sood, Anil kumar Jain
9. A practical approach to anaesthesia for emergency surgery. Manju Gandhi, Anila Malde, Amala Kudalkar, Hemangi Karnik

### Research

The fellow will be expected to complete a research project under the guidance of his/her academic guide. Presentations in conferences and publications will be strongly encouraged.

### Log book

The fellow will be expected to keep a log of the cases attended and submit it at the time of the examination.

**Stipend:** As per MUHS guidelines

**In service candidates:** As per MUHS guidelines

**Admission norms:** As per MUHS guidelines

**Selection Criteria: Fee structure / stipend / accommodation:** As per MUHS guidelines

### Requirements:

The institute / department should have,

1. Operating room fully equipped with endoscopic/basic set up.
2. Dedicated Operating room
3. Conference room and facility for Audio visual
4. Library (Books, Journals and video)

### Criteria for Clinical, Operative Sessions Institutes/ Hospitals

1. Minimum of 50 bedded Hospital/ Institute for Single speciality and 200 bedded hospital for Multispecialty
2. Modern ICU for Postoperative Care
3. Dedicated Operating room fully equipped with Basic infrastructure and Instruments required for surgical gastroenterology.
4. All advanced and latest anaesthesia equipments for surgical gastroenterology should be available.
5. Independent Pathology facilities
6. Imaging devices like Ultrasound ,CT Scan, MRI
7. Conference room facility and facility for Audio visual
8. Library (Books, Journals and Video). The library services available to fellows should include electronic retrieval of information from medical databases
9. Live relay OT facility preferred



10. Independent surgical gastroenterology Department with stipulated criteria of Faculties/Teachers
11. A sufficient number of patients must be available to ensure that fellows receive appropriate experience in the management of complex problems without adversely affecting particular surgery core program. Specifically, a fellowship will not be approved in an institution that has a program deficiency in the pertinent areas of surgery.
12. Institutes with High Volume of surgery work for the specific course/module offered is preferred.
13. Lines of responsibility for general anaesthesia residents and other residents and fellows must be defined clearly. Fellows may serve as teaching assistants for residents when appropriate.
14. Conferences, including medical-surgical reviews, analyses of complications and deaths, seminars, and clinical and basic science instruction, must be regularly scheduled

**Criteria for the faculty with MUHS for Fellowship of Gastroenterology Anaesthesia:**

As per MUHS guidelines

**Program Director**

- A program director must be responsible for the fellowship program.

**Qualifications of the program director**

As per MUHS guidelines

**Responsibilities of the program director**

- It is the responsibility of the program director to support the fellowship program by devoting his or her efforts to its management and administration. The director is also expected to be an active and recognized participant in the institution's clinical and educational programs.
  - Preparation of a written statement to include an outline of the goals of the fellowship program with respect to knowledge, skills, and other attributes, a narrative description of the fellowship, including details of fellows' involvement in clinical, research, teaching, and administrative activities, and a description of the relationship between the fellowship and the general anaesthesia residency program. This statement must be made available to fellows, general surgery residents, the director of the general surgery residency program, and members of the teaching staff.
1. Selection of fellows for the program in accordance with institutional policies and procedures.
  2. Selection and supervision of the teaching staff and other program personnel at each institution participating in the program.
  3. Supervision of fellows through explicit written descriptions of supervisory lines of responsibility for the care of patients. Such guidelines must be communicated to all members of the fellowship program staff.
  4. Organization and supervision of the research activities of fellows.
  5. Organization and supervision of fellows' participation in conferences and other educational activities, and oversight of implementation of the fellowship curriculum.
  6. Implementation of fair procedures, as established by the sponsoring institution, regarding academic discipline complaints and grievances.
  7. Oversight of accurate tabulation and recording of operative logs by surgical fellows in the Fellowship case log system.
  8. Notification in writing to Accreditation Committees of MUHS if there is change in the faculty complement for the fellowship.

**Teaching staff / Faculties**

As per MUHS guidelines

**Rotation:**

A Fellow during his tenure of One year will be rotated through various institutes /faculties for total exposure to various aspects and skill in Specific/specialized Surgery. Rotations to other faculties within the course are important part of the skills curriculum. Rotations are agreed upon by the faculty and optional rotations are available upon request of the fellow and approval by the faculty program director. Upcoming interesting cases by faculty should be broadcast to all fellows through the monthly didactic meetings so freely available fellows can travel to the sites to participate or see these unusual cases.

Evaluations of the fellows by the faculty and of the faculty by the fellows will be performed of all teaching sites every quarter during the year and upon the completion of each away rotation. This requires rotation in

- a) Soft Skill Development and working at skill station and Virtual reality module for co-ordination, basic skills, basic laboratory work and proper perspective
- b) Didactic Lectures /Grand Rounds/ Clinical meetings
- c) Operative sessions in various modules/subjects/expertise in particular surgical procedure in the specified/specialized course
- d) Other

Anaesthesia experience will take place along with the Faculties who will be assigned by MUHS with those hospitals/ institutes who will have MOU with MUHS for training candidates.

### **Clinical Responsibilities**

The fellow will attend and work under the faculty in the recognized institutes on the assigned modules. He/ She will participate in the preoperative assessment and planning as well as the postoperative follow-up of their assigned patients under the faculty guidance.

### **Research Training:**

All Fellows are expected to be intimately involved with the program's research activities, to publish case reports and present their work at local, regional and National meetings and conferences. Most of the research will focus on the current techniques and outcomes evaluations of Procedures. These will involve both clinical and laboratory based work.

The Programme recognizes the necessity that its Fellows have a basic knowledge in Gastroenterology Anaesthesia. Didactics, round table meets and seminars will routinely update the academic content of the programme. This will be supplemented with Clinical Learning, through outpatient clinics, ward rounds and presentations and operative experience in the form of assisting and being proctored over surgical procedures.

**Expectations include:** All Fellows must

- Demonstrate manual dexterity appropriate for their training level.
- Critically evaluate and demonstrate knowledge of pertinent scientific information.
- Practice-based learning and improvement that involve investigation and evaluation of their own patient care, appraisal and assimilation of scientific evidence, and improvements in patient care
- All Fellows will present and review current literature at Journal Clubs.
- All Fellows will be expected to actively participate at local, regional and National seminars and conferences.
- Maintain high standards of ethical behaviour.
- Demonstrate sensitivity to age, race, gender, and culture of patients and other health care professionals
- Practice high-quality, cost-effective patient care.
- Demonstrate knowledge of risk-benefit analysis.

These academic activities will be constantly reviewed by a Senior Faculty.

### **Portfolio Management:**

- All Fellows will maintain a Fellowship PORTFOLIO.
- Two monthly review of following topics by faculty via internet /in person this will include:
- Project work
- Log Book
- Presentations
- On-going Publications
- Number of hours spent on hands on practice
- Summaries of case discussions and presentations.
- Synopsis of publications.

Maintaining accurate case logs is critical to each fellow. These numbers are vital for hospital privileging. It is mandatory that case logs are entered by each fellow into the Specified Course Fellowship Case Log. Case logs need to be printed and brought to the monthly didactic meetings for



review. Failure to do so results in the curtailing of operative privileges. Log book, presentation & project work will be signed & evaluated on a time to time basis by respective faculties.

### **Scheme of Evaluation**

Course evaluation will be done by Credits Based System.

### **Total Credits: 300**

Minimum Number of Credits for successful completion of programme: 240 credits (80%)

Transfer of Credit to and from other Universities: Not at present but will be informed once broad consensus among other universities is established.

### **Breakup of credits**

Should be based on following Modules

Soft Skill: 50

Didactic: 40

Project Work: 25

Video Learning Grand rounds, Faculty Discussion: 15

ICU: 20

Operative: 100

Fellowship Theory: 50

#### **1. Soft Skill Development Module: (50 credits points)**

These include Working at MUHS recognized Basic Skill Institutes, Virtual Reality Stations, Knowledge of surgical gastroenterology procedures, Various anaesthetic Techniques, and Basic knowledge of instrumentation. A candidate may have to take additional Basic course pertaining to any special operative techniques.

#### **2. Didactic Credits: (40 credit points)**

Didactic on various topics as per syllabus spread over one hour lecture. Total 10-20 Lectures depending upon specified course material and depth of theory.

#### **3. Project Work (25 credit point)**

Under faculty guidance a Project work should be done on a decided topic.

**4. Video Learning, Grand Rounds, Faculty Discussions (15 credit Points):** Review of Recorded Procedures with Faculty Input. Specific/specialized Grand Round/Clinical Case Conference. Disease/Journal Club, Round Table Discussions. Imaging investigations. Monitoring, postoperative management, procedures/skills and discussions

#### **5. Surgical Gastroenterology ICU: (20 credit points)**

#### **6. Operative session's credits. (Total 100)**

A Candidate is expected to maintain certified Log book indicating number of cases assisted or individually induced and managed under the guidance of faculty for each Module.

Course Director/Programme Director is required to fill up the requirements according to guidelines presented below and submit it to University

#### **7. Fellowship Theory Examination (50 Credit points)**

### **Soft Skill Development Module / Laboratory Module (50 Credits)**

- Scientific basis of anaesthesia
- Preoperative assessment and preparation
- Standard equipment, techniques and monitoring
- Airway management
- Venous access
- Difficult circulations and ventilation
- Major hazards
- Pain management including regional techniques
- Congenital and inherited diseases
- Haematology and oncology including blood transfusion
- Anaesthesia for basic and advanced Laparoscopic surgery

- Resuscitation
- Blood and blood products transfusion
- Sedation and anaesthesia outside theatres

**Didactic Credits: (40 Credits)**

Anaesthesia management in relation to diseases of

- Oesophagus and diaphragmatic hernia
- Stomach
- Obesity
- Small Intestine
- Colon, rectum, anus
- Appendix
- Liver
- Gall bladder and extra hepatic biliary system
- Pancreas
- Spleen
- Abdominal wall, Omentum, Mesentery, Retroperitoneum
- Laparoscopy

**Surgical Gastroenterology ICU (20 credit points)**

- Nutrition and infection management
- Ventilatory management.
- Strategies for weaning of ventilator
- Elective and emergency procedures in ICU

**Project Work (25 credit point)**

Under faculty guidance a Project work should be done on a decided topic.

**Video Learning, Grand Rounds, Faculty Discussions (15 credit Points):** Review of Recorded Procedures with Faculty Input. Specific/specialized Grand Round/Clinical Case Conference. Disease/Journal Club, Round Table Discussions. Imaging investigations. Monitoring, postoperative management, procedures/skills and discussions

**Operative session credits. (Total 100)**

**Operative Credits:** A Candidate is expected to maintain certified Log book indicating number of cases assisted or individually induced and managed under the guidance of faculty for each Module.

- Oesophagus and diaphragmatic hernia
- Stomach
- Obesity
- Small Intestine
- Colon, rectum, anus
- Appendix
- Liver
- Gall bladder and extra hepatic biliary system
- Pancreas
- Spleen
- Abdominal wall, Omentum, Mesentery, Retroperitoneum
- Laparoscopy
- Other

**Fellowship Theory Examination (50 Credit points)**

The examination for a particular course will be conducted of MCQ/subjective type for judging overall proficiency of a Fellow.

On successful completion of all modules of the Programme the Fellow will be awarded a Certificate of the Fellow in Gastroenterology Anaesthesia by the MUHS.