

# **MD GASTROENTEROLOGY**

## **5 YEARS DEGREE PROGRAMME IN GASTROENTEROLOGY BY**

*Dr. ZAIGHAM ABBAS*  
*CONSULTANT Gastroenterologist*

**STATUTES**

## **Nomenclature of the Proposed Course**

The name of degree programme shall be MD Gastroenterology. This name is well recognized and established for the last many decades worldwide.

### **Course Title:**

MD Gastroenterology

### **Training Centers**

Departments of Gastroenterology (ZIAUDDIN HOSPITAL)

### **Duration of Course**

The duration of MD Gastroenterology course shall be five (5) years with structured training in a recognized department under the guidance of an approved supervisor.

After admission in MD Gastroenterology Programme, the resident will spend first 6 months in the relevant Department of Gastroenterology as Induction period during which resident will get orientation in the chosen discipline and will also participate in the mandatory workshops.

The research project will be designed and the synopsis be prepared during this period. On completion of Induction period, the resident will start formal training in the Basic Principles of Internal Medicine for 18 months. During this period, the resident shall get the research synopsis approved by ETHICAL COMMITTEE of the university. At the end of 2nd year, the candidate will take up Intermediate Examination. During 3rd, 4th & 5th years of the Program, there will be two components of the training:

1. Clinical Training in Gastroenterology
2. Research and Thesis writing

The candidate shall undergo clinical training to achieve educational objectives of MD Gastroenterology (knowledge & skills) along with rotation in the relevant fields, which will be carried out during the 4th and 5th year of the programme.

The clinical training shall be competency-based. There shall be generic and specialty-specific competencies and shall be assessed by continuous Internal Assessment.

The Research Component and thesis writing shall be completed over the five years duration of the course. The Candidate will spend total time equivalent to one calendar year for research during the training. Research can be done as one block or in the form of regular periodic rotation over five years as long as total research time is equivalent to one calendar year.

## **Admission Criteria**

Applications for admission to MD Training Programs will be invited through advertisement in print and electronic media mentioning closing date of applications and date of Entry Examination.

**Eligibility:** The applicant on the last date of submission of applications for admission must possess the:

1. Basic Medical Qualification of MBBS or equivalent medical qualification recognized by Pakistan Medical & Dental Council.
2. Certificate of one year's House Job experience in institutions recognized by Pakistan Medical & Dental Council is essential at the time of interview. The applicant is required to submit House Certificate from the concerned Medical Superintendent that the House Job shall be completed before the Interview.
3. Valid certificate of permanent or provisional registration with Pakistan Medical & Dental Council.

## **Accreditation Related Issues of the Institution**

### **Faculty**

Properly qualified teaching staff in accordance with the requirements of Pakistan Medical and Dental Council (PMDC)

### **Adequate Space**

Including class-rooms (with audiovisual aids), demonstration rooms, computer labs, state-of-the-art Endoscopic unit and clinical pathology labs, etc.

### **Library**

- Departmental library should have latest editions of recommended books, reference books and latest journals (National and International).
- Accreditation of Gastroenterology training program can be suspended on temporary or permanent basis by the University if the program does not comply with requirements for residents training as laid out in this curriculum.
- Program should be presented to the University along with a plan for implementation of curriculum for training of residents.
- Programs should have documentation of residents training activities and evaluation on monthly basis.
- To ensure uniform and standardized quality of training and availability of the training facilities, the University reserves the right to make surprise visits of the training program for monitoring purposes and may take appropriate action if deemed necessary.

## **Aims and Objectives of the Course**

### **Aim**

The aim of five years MD programme in Gastroenterology is to train residents to acquire the competency of a specialist in the field of Gastroenterology so that they can become good teachers, researchers and clinicians in their specialty after completion of their training.

### **GENERAL OBJECTIVES**

MD Gastroenterology training should enable a student to:

#### **Access and apply relevant knowledge to clinical practice:**

- Maintain currency of knowledge
- Apply scientific knowledge in practice
- Appropriate to patient need and context
- Critically evaluate new technology

#### **Safely and effectively perform appropriate clinical skills & procedures:**

- Consistently demonstrate sound clinical skills
- Demonstrate procedural knowledge and technical skill at a level appropriate to the level of training
- Demonstrate manual dexterity required to carry out procedures
- Adapt their skills in the context of each patient and procedure
- Maintain and acquire new skills
- Approach and carry out procedures with due attention to safety of patient, self and others
- Critically analyze their own clinical performance for continuous improvement

#### **Design and implement effective management plans:**

- Recognize the clinical features, accurately diagnose and manage gastroenteric problems
- Formulate a well-reasoned provisional diagnosis and management plan based on a thorough history and examination
- Formulate a differential diagnosis based on investigative findings
- Manage patients in ways that demonstrate sensitivity to their physical, social, cultural and psychological needs
- Recognize disorders of the Gastroenterological system and differentiate those amenable to medical treatment
- Effectively recognize and manage complications
- Accurately identify the benefits, risks and mechanisms of action of current and evolving treatment modalities
- Indicate alternatives in the process of interpreting investigations and in

- decision-making
- Manage complexity and uncertainty
  - Consider all issues relevant to the patient
  - Identify risk
  - Assess and implement a risk management plan
  - Critically evaluate and integrate new technologies and techniques

**Organize diagnostic testing, imaging and consultation as needed:**

- Select medically appropriate investigative tools and monitoring techniques in a cost-effective and useful manner
- Appraise and interpret appropriate diagnostic imaging and investigations according to patients' needs
- Critically evaluate the advantages and disadvantages of different investigative modalities

**Communicate effectively:**

- Communicate appropriate information to patients (and their family) about procedures, potentialities and risks associated, in ways that encourage their participation in informed decision making
- Communicate with the patient (and their family) the treatment options including benefits and risks of each
- Communicate with and co-ordinate health management teams to achieve optimal patient management
- Initiate the resolution of misunderstandings or disputes
- Modify communication to accommodate cultural and linguistic sensitivities of the patient

**Recognize the value of knowledge and research and its application to clinical practice:**

- Assume responsibility for self-directed learning
- Critically appraise new trends in Gastroenterology
- Facilitate the learning of others

**Appreciate ethical issues associated with Gastroenterology:**

- Consistently apply ethical principles
- Identify ethical expectations that impact on medico-legal issues
- Recognize the current legal aspects of informed consent and confidentiality
- Be accountable for the management of their patients

**Professionalism by:**

- Employing a critically reflective approach to Gastroenterology
- Adhering to current regulations concerning workplace harassment

- Regularly carrying out self and peer reviewed audit
- Acknowledging and having insight into their own limitations
- Acknowledging and learning from mistakes

**Work in collaboration with members of an interdisciplinary team where appropriate:**

- Collaborate with other professionals in the selection and use of various types of treatments assessing and weighing the indications and contraindications associated with each type
- Develop a care plan for a patient in collaboration with members of an interdisciplinary team
- Employ a consultative approach with colleagues and other professionals
- Recognize the need to refer patients to other professionals

**Management and Leadership**

- Effective use of resources to balance patient care and system resources
- Identify and differentiate between system resources and patient needs
- Prioritize needs and demands dealing with limited system resources
- Manage and lead clinical teams
- Recognize the importance of different types of expertise which contribute to the effective functioning of clinical team
- Maintain clinically relevant and accurate contemporaneous records

**Health advocacy:**

- Promote health maintenance of patients
- Advocate for appropriate health resource allocation

**Specific Learning Outcomes**

Residents completing MD Gastroenterology training will have formal instruction, clinical experience, and will be able to demonstrate competence in the evaluation and management of adult and paediatric patients and applying scientific principles for the identification, prevention, treatment and rehabilitation of following acute and chronic disorders in Gastroenterology.

**Esophagus**

- Reflux Disorders
- Medical and Surgical Management of Reflux
- Barrett's Esophagus
- Dysplasia and endoscopic management
- Rumination syndrome, belching, aerophagia, hiccoughs
- Evaluation of acid peptic disorders of the gastrointestinal tract
- Peptic ulcer disease and H. pylori
- Non-ulcer dyspepsia

- NSAID in the pathogenesis of gastroduodenal ulcers and their complications
- Gastroparesis and post-surgical gastric issues
- Motor disorders of the gastrointestinal tract
- Achalasia, diffuse esophageal spasm and other spastic disorders, non-cardiac chest pain, intestinal pseudo-obstruction and scleroderma

### **Other Stomach Conditions**

- Gastric Polyps
- Gastric Carcinoids

### **Irritable bowel syndrome and Functional GI disorders**

- Disorders of nutrient assimilation/malnutrition

### **Inflammatory bowel diseases (IBD)**

- Diagnosis and management
- Immunomodulators and biologic therapy for IBD, advancements
- Post-surgical management of IBD
- Complications of IBD / surgical complications and management
- Serologic markers and drug metabolite in IBD
- Issues in surveillance and management of dysplasia in IBD

### **Colonic Disease**

- Colon cancer and screening
- Polyp surveillance, malignant polyps/serrated adenomas
- Constipation, pelvic floor dysfunction, evaluation and management
- Diverticular disease and complications/diverticulitis
- Endoscopic resection of colorectal polyps, guidelines and management
- Familial colorectal cancer
- Evidence-based guidelines for cancer management and guidelines

### **Other small bowel and colonic diseases**

- Short gut syndrome
- Small bowel bacterial overgrowth syndrome
- Non-specific colitis
- Radiation colitis and enteritis
- Solitary rectal ulcer syndrome

- Diversion colitis
- Graft vs host disease

### **Vascular Disorders of the Gastrointestinal Tract**

- Mesenteric ischemia
- Acute ischemic colitis/chronic mesenteric ischemia
- Portal venous thrombosis

### **Gastrointestinal Infections**

- Retroviral, mycotic, and parasitic diseases
- Clostridium difficile infection and management of recurrent disease

### **Gastrointestinal Diseases with an Immune Basis**

- Celiac sprue
- Eosinophilic GI disorder/allergic GI disorder
- GI involvement in autoimmune disorders

### **Gastrointestinal Neoplastic Disease**

- Tumor biology
- Neuroendocrine tumors
- Gastrointestinal lymphoma
- Anal canal cancer
- Chemotherapy and radiation treatment for GI malignancies
- Familial risk of gastric/esophageal cancer
- GI stromal tumors
- HIV-related malignancy

### **Hepatology**

- Acute viral hepatitis
- Alcoholic liver disease
- Non-alcoholic fatty liver disease
- Fulminant hepatic failure
- Chronic viral hepatitis
- HBV resistance
- Treatment of viral hepatitis (B and C)
- Spontaneous bacterial peritonitis and hepatorenal syndrome in liver failure
- Management of complications of liver disease
- Drug and toxin-induced liver disease

- Pregnancy-related hepatobiliary disease
- Cholestatic syndromes (Primary sclerosing cholangitis/primary biliary cirrhosis etc)
- Genetic liver diseases (hemochromatosis, alpha-1 antitrypsin deficiency, Wilson's disease)
- Complication of chronic liver disease
- Autoimmune liver diseases
- Vascular disorders of liver (Budd-Chiari and ischemic/hypoxic hepatitis)
- Perioperative evaluation and management of liver disease patient
- Pre-transplant evaluation
- Management and evaluation of post-transplant patients
- Hepatocellular carcinoma/other hepatic malignancy
- Liver imaging modalities

### **Pancreatic Diseases**

- Acute pancreatitis
- Chronic pancreatitis
- Pancreatic function studies
- Idiopathic pancreatitis
- Nutritional support in acute and chronic pancreatitis
- Radiologic evaluation of pancreas and biliary tract
- Biliary dyskinesia/sphincter of Oddi dysfunction
- Pancreatic divisum
- Molecular genetics of hereditary pancreatic disorders
- Pancreatic cancer

### **Biliary Diseases**

- Abdominal pain and evaluation
- Gall stone disease and acute cholecystitis (calculous and acalculous)
- Neoplastic diseases of the gallbladder and bile ducts

### **Pediatric Gastroenterology**

- IBD issues in pediatric population
- Neonatal jaundice and cholestasis
- Common pediatric gastrointestinal problems:
  - Abdominal pain
  - Constipation
  - Diarrhea
  - Cystic fibrosis
  - Necrotizing enterocolitis
  - Meckel's diverticulum

- Intestinal intussusception
- Mid-gut volvulus
  
- GI complications of malignancy and treatment
- Rickets and other systemic disorders in GI and liver diseases

### **Geriatric Gastroenterology**

- Endoscopic gastrostomy tube risks and complications
- Evaluation and risks of endoscopic procedures among elderly
- Effect of aging on gastrointestinal tract and common GI illness among elderly population

### **Gastrointestinal Bleeding**

- Upper GI bleeding
- Non-variceal GI bleeding and management
- Variceal bleeding and management
- Lower GI bleeding and management
- GI bleeding of obscure origin, evaluation and management (including arteriovenous malformations)

### **Genetic/Inherited Disorders**

- Genetic marker in Crohn's disease

### **Advanced Endoscopic Technique**

- Capsule endoscopy
- Double balloon enteroscopy
- Single fiber endoscopy
- Narrow band imaging
- Confocal (high magnification endoscopy)
- Anticoagulants and antiplatelet agents and GI endoscopy
- Complications of endoscopic procedures

### **Anal Canal Diseases/Disorder**

- Hemorrhoids and anal fissure
- Anal canal benign and malignant diseases
- Fecal incontinence and evaluation
- Fecal impaction

## **Foreign body management**

### **Other Topics**

- Gastrointestinal and biliary manifestations of HIV infections
- Systemic diseases affecting GI and liver, including para-neoplastic disorders

### **Management of GI emergencies in the acutely ill patient including ileus Advanced Imaging Techniques in GI/Liver**

- CT Colonography
- CT enterography
- PET Scan

### **Nutrition**

- Nutritional issues in patients with IBD

### **Techniques Used in the Basic Investigation of Gastrointestinal Cancer**

- Flow cytometry
- Polymerase chain reaction assays
- Mutation analysis
- Methylation assays
- DNA sequencing and linkage analysis

### **Professional Skills**

Residents shall learn professional skills in:

- Patient management including eliciting pertinent history, performing physical examination, ordering and interpreting the result of appropriate investigations and thereby deciding and implementing appropriate treatment plan by maintaining follow up
- Psychosocial and emotional effects of acute and chronic illness on patients and their families
- Management of end-of-life issues and palliative care
- Quality improvement and patient safety activities

## **Procedural and Technical Skills**

Residents shall learn technical and procedural skills in:

- Blood sample collection — venepuncture and finger prick methods of sample collection, use of different types of anticoagulants, containers and the effects of delay in processing and storage

Trainees should have knowledge of the indications, results and methods for:

- Breath testing for H. pylori, bacterial overgrowth
- Oesophageal and rectal manometry and pH testing
- Gastric secretory tests
- Tests for gut absorption and inflammation
- Radiological evaluation of the GI tract
- Liver function tests
- Intestinal biopsy
- Liver biopsy
- Paracentesis

## **Endoscopic Procedures**

- Upper GI endoscopy including esophagogastro-duodenoscopy
- Endoscopic therapy of benign and malignant oesophageal strictures
- Thermal therapy of gastro-oesophageal tumours, ulcers and vascular malformations
- Direct injection/banding techniques for bleeding lesions and tumour
- Enteroscopy
- Flexible sigmoidoscopy
- ERCP; Therapeutic

- Diagnostic total colonoscopy
- Colonoscopic therapy of benign and malignant tumours and strictures
- Review of normal and abnormal blood films with emphasis on morphology of red cells, white cells and platelets
- Familiarization with cytogenetics, understanding the principles of cytogenetics and appreciating the relevance and significance of chromosomes in diagnostic hematology and Gastroenterology
- Understanding the principles involved in the molecular diagnosis of Gastroenteric disorders by:
  - Flow cytometry
  - PCR
  - FISH
  - Western and Southern Blotting
  - Microarray technology
- Interpretation of imaging techniques commonly employed in the evaluation of patients with critical illness
- Practice infection control procedures and perform continuous quality improvement

**Basic Sciences**  
**CONTENT OUTLINE**  
**MD Gastroenterology**

Student is expected to acquire comprehensive knowledge of Physiology, Pathology and Pharmacology relevant to the clinical practice appropriate for Gastroenterology.

**1. Physiology**

Cellular Organization, Structure–Function Correlations and Physiological Alterations in the Endocrine Organ Systems of the Body

**Structural and Functional Organization of the Cells of the Body**

- Concept of cells as the structural, functional and genetic units of the body.
- Composition of protoplasm, division into cytoplasm and nucleus.
- Role of macromolecules in the structural organization of the cell.
- Cell components with their role in cell function.
- Diversity of cell morphology as related to the varied functional demands. Physical activities of the living cells, intracellular movements, cellular locomotion, endocytosis and exocytosis.
- Basic concepts of the principles of transport through cell membrane, membrane potential and action potential.
- The cell cycle and cell division.
- Energy balance, metabolism & nutrition.
- Uses of cell and tissue cultures.
- DNA and RNA structure and protein synthesis.

### **Gastrointestinal Function**

- General functions of the gastrointestinal system
- Motor functions
- Reservoir function
- Digestion and absorption
- Emptying function
- Regulation of gastrointestinal function
- Motility
- Mastication
- Swallowing
- Gastric motility
- Intestinal motility
- Gall bladder motility
- Secretory Activity
- Formation, composition, function and control of saliva, gastric, pancreatic, bile and intestinal secretions.
- Control of Secretions
- Cephalic phase
- Gastric phase
- Intestinal phase
- Interdigestive phase
- GIT hormones controlling activities: Functions of the stomach, pancreas, gall bladder, liver and large intestine.
- Formation and composition of faeces, haustral churning, slow peristalsis, mass peristalsis, mechanism of defecation.
- Circulation of bile. Principles and assessment of liver function tests. Interpretation of data, diagnostic tests.
- Hyperbilirubinaemia and congenital hyperbilirubinaemias.
- Hunger and thirst centers of the brain.
- Control of hunger, appetite and its disorders.
- Membrane biochemistry and signal transduction.

- Gene expression and the synthesis of proteins.
- Bioenergetics; fuel oxidation and the generation of ATP.
- Enzymes and biologic catalysis.
- Tissue metabolism.

## **Vitamins**

- Classification, components, sources, absorption and functions (physiological and biochemical role).
- Daily requirements, effects of deficiency and hypervitaminosis.
- Salient morphologic features of diseases related to deficiency or excess of vitamins.

## **Minerals**

- Sources of calcium, phosphorus, iron, iodine, fluorine, magnesium and manganese.
- Trace elements and their clinical importance.
- Absorption and factors required for it.
- Functions and fate.

## **METABOLISM**

- Metabolic rate and basal metabolic rate.
- Factors influencing metabolic rate, principles of measurement.

## **Carbohydrates**

- Classification and dietary sources.
- Digestion, absorption and utilization of dietary carbohydrates. Glucose tolerance test.
- Glycogenesis, glycolysis, gluconeogenesis, glycogenolysis, processes with the steps involved and effects of hormones.
- Citric acid cycle, steps involved, its significance and the common final metabolic pathway.
- Hexose monophosphate shunt: mechanism and significance.

## **Lipids**

- Classification of simple, derived and compound lipids.
- Dietary sources.
- Digestion, absorption, utilization and control.
- Fatty acid oxidation with steps involved.
- Ketogenesis and its significance.

- Lipotropic factors and their actions. Lipoproteins, types and importance.

### **Proteins and Amino Acids**

- Classification and dietary sources of proteins.
- Digestion, absorption, utilization and control.
- Fate of amino acids.
- Urea formation with steps involved.
- Functions and effects of deficiency.

### **Nucleoproteins**

- Structure and metabolism.

### **Pigment Metabolism**

- Basic concept of endogenous and exogenous pigments.
- Causes of pigmentation and depigmentation.
- Disorders of pigment metabolism, inherited disorders, acquired disorders from deficiency or excess of vitamins, minerals, fats, carbohydrates, proteins etc.

### **Balanced Diet**

- Requisites of an adequate diet.
- Role of carbohydrates, fats, proteins, minerals, vitamins and water in diet.
- Principles of nutrition as applied to medical problems.

### **Biotechnology and Concepts of Molecular Biology**

- With special emphasis on use of recombinant DNA techniques in medicine and the molecular biology of cancer.

## **2. Pharmacology**

- The Evolution of Medical Drugs
- British Pharmacopoeia
- Introduction to Pharmacology
- Receptors
- Mechanisms of Drug Action
- Pharmacokinetics
- Pharmacokinetic process

- Absorption
- Distribution
- Metabolism
- Desired plasma concentration
- Volume of distribution
- Elimination
- Elimination rate constant and half-life
- Creatinine clearance
- Drug Effect
- Beneficial responses
- Harmful responses
- Allergic responses
- Drug dependence, addiction, abuse and tolerance
- Drug interactions
- Drug use in pregnancy and in children
- Autonomic Pharmacology

Basic concepts of pharmacokinetics and dynamics of:

Pharmacology of drugs used in GI disorders e.g. antacids, motility drugs, anti-H. pylori therapy, drugs controlling other GI secretions, ulcerative colitis and immunosuppressive drugs.

- Immunopharmacology
- Chemotherapy
- Antibacterial, antimycobacterial, antiviral, antifungal and antiparasitic
- Vitamins and antioxidants

### **3. Pathology**

Pathological alterations at cellular and structural level along with brief introduction of Basic Microbiology and Haematological Pathology as related to medicine.

#### **Cell Injury and Adaptation**

- Reversible and irreversible injury
- Fatty change, pathologic calcification
- Necrosis and gangrene
- Atrophy, hypertrophy, hyperplasia, metaplasia, aplasia

#### **Inflammation**

##### **Acute Inflammation**

- Cellular components and chemical mediators of acute inflammation
- Exudates and transudate
- Sequelae of acute inflammation

## **Chronic Inflammation**

- Etiological factors and pathogenesis
- Distinction between acute and chronic (duration) inflammation
- Histologic hallmarks
- Types of chronic inflammation, non-granulomatous and granulomatous, and their causes

## **Haemodynamic Disorders**

- Etiology, pathogenesis, classification and morphological and clinical manifestations of edema, haemorrhage, thrombosis, embolism, infarction & hyperaemia
- Shock; classification, etiology, and pathogenesis, manifestations
- Describe the compensatory mechanisms involved in shock
- Describe the pathogenesis and possible consequences of thrombosis
- Describe the difference between arterial and venous emboli

## **Neoplasia**

- Dysplasia and neoplasia
- Benign and malignant neoplasms
- Etiological factors for neoplasia
- Different modes of metastasis
- Tumor staging system and tumor grade

## **Immunity and Hypersensitivity**

- Immunity
- Immune response
- Diagnostic procedures in a clinical microbiology laboratory
- Protective immunity to microbial diseases
- Tumour immunology
- Immunological tolerance, autoimmunity and autoimmune diseases
- Transplantation immunology
- Hypersensitivity
- Immunodeficiency disorders
- Immunoprophylaxis & immunotherapy

## **Haematopathology**

- Normal blood picture & variation in disease

## **Microbiology**

- A brief account of the classification of microorganisms.
- Role of microbes in various human diseases.
- Infection source.
- Bacterial growth and death.
- Names, habitat, modes of transmission/infection, pathogenic mechanism and pathological changes produced by bacteria, commonly causing human diseases in Pakistan.
- Names of bacteria and diseases produced by bacteria not commonly found in Pakistan.

## **Morphology**

- Identification of various shapes of bacteria and viruses under the microscope.
- Distribution, size, motility, reproduction and functions of bacteria and viruses.
- Gram staining and AFB staining, culture of blood and fluid; details regarding methodology in collection, transportation and preservation.
- Culture media for common pathogens and methods of culture.
- Special culture media. Basis of sensitivity tests.

## **Fungal Diseases**

- Names, general morphological features, and diseases produced by fungi commonly found in Pakistan, including dermatophytes, maduromycosis and opportunistic infections.

## **Important Parasites**

- Names and modes of infection of parasitic diseases commonly found in Pakistan including amoebiasis, malaria, leishmaniasis, ascariasis, cestodiasis, ankylostomiasis, giardiasis, hydatid disease and guinea worm disease.
- Important Viruses
  - Sterilization and disinfection
  - Immunization
  - Nosocomial infections
  - Use of investigation and procedures in laboratory
  - Saliva, stool, cerebrospinal fluid (CSF), pus, aspirates

## **Specialty Training in Gastroenterology**

### **Specific Program Content**

- Specialized training in Gastroenterology
- Compulsory rotations

- Research & thesis writing
- Maintaining of log-book

## **UPPER GASTROINTESTINAL DISORDERS**

### **Esophageal Disorders**

- Motility of the esophagus and motor disorders
- Mechanism of deglutition and dysphagia
- Achalasia, diffuse esophageal spasm and other spastic disorders
- Non-cardiac chest pain
- Approach to a patient with dysphagia
- Gastro-esophageal reflux disease
- Tumors of the esophagus
- Esophageal webs, membranes and diverticulum
- Management of benign and malignant esophageal strictures
- Dysplasia and endoscopic management
- Rumination syndrome, belching, aerophagia, hiccups, evaluation
- Esophagus and systemic diseases
- Infectious diseases of the esophagus
- Foreign bodies in the esophagus and stomach
- Esophageal perforation
- Drug-induced esophagitis

### **Gastric Disorders**

- Physiology of acid and bicarbonate secretion in health and diseases
- Defence mechanisms against acid and pepsin
- Gastroduodenal motor function in health and diseases
- Gastritis (nonspecific and specific)
- Helicobacter pylori infection
- Peptic ulcer
- Dyspepsia
- Stress and stomach
- Gastric hypersecretory states including Zollinger Ellison syndrome
- Ulcer complications and their management
- Surgery for peptic ulcer
- Post-gastrectomy complication
- Bezoars
- Tumors of the stomach including gastric polyps and gastric carcinoids
- Diverticuli and hernia of the stomach

## **LOWER GASTROINTESTINAL DISORDERS**

## **Small Intestinal Disorders**

- Motility of the small intestine
- Congenital anomalies
- Normal absorption of the nutrients
- Intestinal electrolyte absorption and secretion
- Malabsorption syndromes
- Pathophysiology, manifestations and approach
- Celiac sprue
- Infection-related diseases
- Intestinal microflora in health and diseases
- Tropical sprue
- Whipple's disease
- Infectious diarrhoea and food poisoning
- Parasitic diseases
- Small intestinal ulcers
- Short bowel syndrome and intestinal transplantation
- Eosinophilic gastroenteritis
- Food allergies
- Intestinal obstruction
- Intestinal pseudo-obstruction and scleroderma
- Irritable bowel syndrome and functional GI disorders
- Disorders of nutrient assimilation/malnutrition
- Acute appendicitis
- Malrotation of the gut
- Bezoars
- Management of diarrhoea
- GI lymphomas
- Small intestinal tumors

## **Colonic Disorders**

- Motility of the colon and disorders of motility
- Congenital anomalies
- Megacolon
- Constipation
- Colonic pseudo-obstruction
- Fecal incontinence
- Antibiotic-associated diarrhoea
- Inflammatory bowel disease
- Inflammatory Bowel Disease
- Ulcerative colitis
- Crohn's disease
- Indeterminate colitis
- Ileostomies and its management
- Diverticular disease and complications/diverticulitis

- Radiation entero-colitis
- Colonic polyps and polyposis syndromes
- Malignant diseases of the colon
- Colon cancer and screening
- Polyp surveillance, malignant polyps/serrated adenomas
- Constipation, pelvic floor dysfunction, evaluation and management
- Endoscopic resection of colorectal polyps, guidelines and management
- Familial colorectal cancer
- Evidence-based guidelines for post-colon cancer management and guidelines

### **Other small bowel and colonic diseases**

- Constipation and pelvic floor dysfunction
- Small bowel bacterial overgrowth syndrome
- Collagenous and microscopic colitis
- Non-specific ulcerations of the colon
- Malakoplakia
- Pneumatosis cystoides intestinalis
- Microscopic colitis
- Radiation colitis and enteritis
- Solitary rectal ulcer syndrome
- Diversion colitis
- Graft vs host disease
- Diseases of the anorectum
- Hemorrhoids and anal fissure
- Anal canal benign and malignant diseases
- Fecal incontinence and evaluation, fecal impaction

### **Gastrointestinal Immune Disorders and Infections**

- Retroviral, mycotic, and parasitic diseases
- C. difficile infection and management of recurrent disease
- Celiac sprue
- Eosinophilic GI disorder/allergic GI disorder
- GI involvement in autoimmune disorders

### **Vascular Diseases of the GI Tract**

- Mesenteric ischemia
- Acute ischemic colitis/chronic mesenteric ischemia
- Portal venous thrombosis

### **Pediatric Gastroenterology**

- IBD issues in pediatric population

- Neonatal jaundice and cholestasis
- Common pediatric gastrointestinal problems:
  - Abdominal pain
  - Constipation
  - Diarrhea
  - Cystic fibrosis necrotizing enterocolitis
  - Meckel's diverticulum
  - Intestinal intussusception
  - Mid-gut volvulus
- GI complications of malignancy and treatment
- Rickets and other systemic disorders in GI and liver diseases

### **Geriatric Gastroenterology**

- Endoscopic gastrostomy tube risks and complications
- Evaluation and risks of endoscopic procedures among elderly
- Effect of aging on gastrointestinal tract and common GI illness among elderly population

### **Parenteral and Enteral Nutrition**

- General indications and contraindications for parenteral and enteral nutrition
- Utility of central and peripheral parenteral nutrition including advantages and disadvantages
- IV access utilized in parenteral nutrition
- Major components of nutritional assessments and demonstrate the calculations for the usual requirements of fluids, carbohydrates, protein, fat and calories
- Parenteral nutrition formula for a given patient
- Advantages and disadvantages of total nutrient admixture system
- Application of transitional therapy as it applies to parenteral nutrition
- Rationale and benefit of early enteral feeding
- Differences in macronutrients available in enteral formulas
- Benefits that enteral products with fiber provide
- Advantages/disadvantages of polymeric, partially hydrolyzed and disease-specific formulas
- Formula osmolarity and its effect on enteral feeding tolerance
- Indications and advantages and disadvantages of the following access routes: nasogastric, gastrostomy and jejunostomy
- Difference between continuous and intermittent feedings, including advantages, disadvantages and general administration protocols
- Complications of parenteral and enteral nutrition including mechanical, gastrointestinal, infectious and metabolic
- Monitoring guidelines for parenteral and enteral nutrition

### **Gastrointestinal Oncology**

## ***Esophageal Cancer***

- Risk factors
- Indications for endoscopy in diagnosis and staging
- Indications for nutritional support
- Importance of combined modality therapy
- Role of palliative chemotherapy and other supportive measures

## **Gastric Cancer**

- Risk factors
- Major surgical approaches to the disease and potentially curative role of combined modality therapy
- Role of palliative chemotherapy and other supportive measure

## **Colon Cancer**

- Risk factors and rationale for screening of colorectal cancer, as well as its chemoprevention
- Role of genetic testing in colorectal cancer
- Surgical staging
- Indications for adjuvant therapies in colon and rectal cancers and role of chemotherapy in advanced metastatic disease
- Heritable types of colon cancer and differences in their pattern of spread and management
- GI stromal tumors
- HIV-related malignancy

## **Anal cancer**

- Association of human papilloma virus and anal cancer
- Role of combined modality therapy in organ preservation

## **Hepatobiliary Cancers**

- Epidemiology and risk factors
- Role of alpha-fetoprotein in diagnosis, response assessment and screening of hepatobiliary cancers
- Indications for curative role of surgery in localized disease
- Role of systemic and intra-arterial chemotherapy

## **Pancreatic Cancer**

- Risk factors
- Genetic aspects of pancreatic cancer
- Role of endoscopy

- Role of molecular diagnosis
- Curative role of surgery in rare patients and palliation in others
- Palliative role of chemotherapy in advanced disease

### **Techniques Used in the Investigation of Gastrointestinal Cancers**

- Flow cytometry
- Polymerase chain reaction assays
- Mutation analysis
- Methylation assays
- DNA sequencing and linkage analysis

### **Clinical Pharmacology of Gastrointestinal Disorders**

- Structure/activity relationships and physicochemical properties relating to agents used in the treatment of following common GI disorders:
- Dosage schedules used in the treatment and maintenance of peptic ulcer disease and NSAID-induced ulcers.
- Anti-secretory effects of H<sub>2</sub>-receptor antagonists, proton pump inhibitors, anticholinergics, prostaglandins, antacids, and antibacterials in the treatment and management of peptic ulcer disease and NSAID-induced ulcers.
- Significance of side effects/adverse reactions and drug interactions of anti-ulcer medications.
- Rational pharmacologic treatment plan for preventing the complications of stress-related mucosal damage.
- Monitoring plan, including efficacy and toxicity profile for the prophylactic regimen chosen.
- Mechanism of action, doses, adverse drug reactions, drug interactions, clinical efficacy for the available drug therapy for GERD.
- Classifications and histological abnormalities of drug-induced liver disease.
- Treatment modalities for hepatic diseases and complications.
- Prophylaxis including doses for acute viral hepatitis.
- Drugs causing acute pancreatitis.
- Role of non-pharmacologic and pharmacologic treatment modalities in the management of acute and chronic pancreatitis.
- Appropriate pharmacologic treatments for the management of fluid depletion, electrolyte derangements, pain, chronic nutritional deficiencies and malabsorption experienced by patients with acute and chronic pancreatitis.
- Structure/activity relationships and physicochemical properties relating to agents used in the treatment of pancreatitis.
- Role of corticosteroids and sulfasalazine in managing IBD with indications for this agent in IBD, proposed mechanism(s) of action, recommended dosages at various stages of the disease and untoward effects associated with their use.
- Immunosuppressives (i.e., azathioprine, cyclosporine), infliximab, immune adjuvants (i.e., levamisole), mast cell stabilisers (i.e., cromolyn sodium) in the treatment of IBD.

- Metronidazole and antidiarrhoeal agents such as anticholinergics, antispasmodics and bile salt-binding resins in IBD.
- Proposed mechanism of action, site of action, efficacy and side effects of the following antiemetic drugs:
  - Phenothiazines
  - Benzodiazepines
  - Antihistamines
  - Anticholinergics
  - Ondansetron
  - Cannabinoids
  - Metoclopramide
  - Corticosteroids
- Potential benefits of combining two or more antiemetic agents and give examples.
- Drugs that are known to cause constipation and diarrhoea.
- Non-pharmacologic management of complications or causes of diarrhoea and constipation.
- Mechanisms of action, doses, adverse effects, and drug interactions of medications used in the management of diarrhoea and constipation.
- Appropriate questions to ask a patient being assessed for diarrhoea or constipation.

## **GI Radiology**

- Reading and interpreting the common X-ray films including X-ray films of the abdomen.
- Barium studies, ultrasound examination.
- CT scans, MR scans, angiography and ERCP films.
- CT colonography.
- CT enterography.
- PET scan.

## **Endoscopic Training**

- Endoscopes and accessories.
- Sterilisation of endoscopes and accessories.
- Other electrosurgical instruments.
- Consent and pre-procedure patient evaluation.
- Sedation and monitoring.
- Advanced endoscopic technique.
- Capsule endoscopy.
- Double balloon enteroscopy, single fibre endoscopy, narrow band imaging and confocal (high magnification endoscopy).
- Anticoagulants and antiplatelet agents and GI endoscopy.
- Complications of endoscopic procedures.

## **Clinical/Laboratory Tests for GI Structure and Function**

- Oesophageal, gastric and ano-rectal function tests; oesophageal pH monitoring, oesophageal and ano-rectal motility/manometry, gastric emptying studies.
- Gastric secretion tests; relevance of 24h intragastric H<sup>+</sup> concentration, maximal acid output, effect of pentagastrin and gastrin-releasing peptide.
- Tests for malabsorption; SeHCAT, PABA, lactose breath H<sub>2</sub>, lactulose breath H<sub>2</sub>, faecal elastase.
- Tests for inflammation; serological and nuclear medicine testing including Tc WBC scans.
- Radiological evaluation; plain X-rays of abdomen, barium studies of GI tract, CT, MRI and ultrasound.
- Histopathology evaluation; histological features of common gastrointestinal and liver disease with appreciation of the histological findings in discussion with histopathologists.

### **Common Gastrointestinal Manifestations**

- Anorexia and weight loss.
- Nausea and vomiting.
- Cyclical vomiting in adults and idiopathic nausea.
- Dysphagia and non-cardiac chest pain.
- Upper abdominal pain/dyspepsia.
- Peptic ulcer type dyspepsia.
- Gall bladder type dyspepsia.
- Non-ulcer dyspepsia.
- Steatorrhoea malabsorption.
- Gastrointestinal bleeding.
- Evaluation of anaemia.
- Iron deficiency anaemia.
- Macrocytic anaemia.
- Short bowel syndrome/ileostomy diarrhoea.
- Acute abdominal pain.
- Chronic abdominal pain.
- The spectrum of functional bowel disorders including burden of disease, subtypes and aetiological factors.
- Oesophageal dysmotility.
- Functional dyspepsia:
  - Epigastric pain syndrome.
  - Postprandial distress syndrome.
- Irritable bowel syndrome and its subtypes.
- Diarrhoea/constipation.
- Obstructive defecation, proctalgia fugax.
- Change in bowel habit.
- Rectal bleeding and perianal fistulae.
- Jaundice.
- Hepatosplenomegaly and abdominal swelling.
- Abdominal masses including cysts.
- Confusion progressing to liver failure.

## Miscellaneous

- Gastrointestinal tuberculosis.
- HIV and the GIT, hepatobiliary and pancreatic systems.
- GIT and liver in systemic diseases.
- Cutaneous manifestations of GI diseases.
- Gastrointestinal side effects of drugs especially NSAIDs.
- Management of GI emergencies in the acutely ill patient including ileus.
- Foreign body management.

## HEPATOLOGY

### Hepatic Disorders

- Functions of the liver.
- Microcirculation of liver.
- Liver function tests.
- Acute viral hepatitis.
- Chronic hepatitis.
- HBV resistance.
- Treatment of viral hepatitis (B and C).
- Fulminant hepatic failure.
- Subacute hepatic failure.
- Alcoholic liver disease.
- Non-alcoholic fatty liver disease.
- Spontaneous bacterial peritonitis and hepatorenal syndrome in liver failure.
- Tips in the management of complications of liver disease.
- Cirrhosis of liver.
- Portal hypertension.
- Extrahepatic portosplenic vein obstruction.
- Hepatic venous outflow tract obstruction.
- Fibrocystic diseases of the liver.
- Ascites.
- Non-cirrhotic portal fibrosis.
- Drug and toxin-induced liver disease.
- Pregnancy-related hepatobiliary disease.
- Cholestatic syndromes (primary and secondary sclerosing cholangitis/primary biliary cirrhosis etc.).
- Genetic liver diseases (hemochromatosis, alpha-1 antitrypsin deficiency, Wilson's disease).
- Metabolic liver disease.
- Liver in porphyria.
- Infections of the liver.
- Liver in congestive heart failure.
- Complication of chronic liver disease.

- Autoimmune liver diseases.
- Vascular disorders of liver (Budd-Chiari and ischaemic/hypoxic hepatitis).
- Perioperative evaluation and management of liver disease patient.
- Liver transplantation and artificial liver support.
- Pre-transplant evaluation.
- Management and evaluation of post-transplant patients.
- Hepatocellular carcinoma/other hepatic malignancy.
- Liver imaging modalities.
- Liver biopsy.

### **Biliary Tract Disorders**

- Physiology of bile formation and excretion.
- Enterohepatic circulation.
- Bilirubin metabolism.
- Approach to patients with jaundice.
- Gallstones, its complications, and management.
- Acute acalculous cholecystitis.
- Miscellaneous disorders of the gallbladder.
- Acute cholangitis.
- Benign biliary stasis.
- Benign and malignant neoplasms of the biliary system.
- Endoscopic management of biliary obstruction.
- Motility and dysmotility of the biliary system and sphincter of Oddi dysfunction.
- Congenital diseases of the biliary system.

### **Pancreatic Disorders**

- Pancreatic function tests.
- Acute pancreatitis.
- Recurrent acute pancreatitis.
- Chronic pancreatitis.
- Idiopathic pancreatitis.
- Nutritional support in acute and chronic pancreatitis.
- Radiologic evaluation of pancreas and biliary tract.
- Biliary dyskinesia/sphincter of Oddi dysfunction.
- Pancreatic divisum.
- Molecular genetics of hereditary pancreatic disorders.
- Malignancies of the pancreas (exocrine and endocrine).
- Cystic fibrosis and other childhood disorders of the pancreas.
- Hereditary pancreatitis.
- Pancreatic transplantation.

### **Compulsory Rotations in the Relevant Fields for 3–6 Months**

## **Clinical training experiences are described below:**

### **Intensive Care Units**

On this 3-month rotation, the resident shall develop competence in the differential diagnosis and management of the critically ill, and learn to integrate these clinical skills with the biomedical instrumentation of bedside haemodynamic measurements, right heart catheterisation, measurement and computation of gas exchange variables, cardiac output determination, and all aspects of mechanical ventilation and airway care. These principles, and those governing fluid therapy, nutritional support, and antimicrobial therapy in severely ill patients, shall be reviewed extensively.

### **Outpatient Services**

Gastroenterological outpatient training shall be provided during the entire residency in continuity to review findings and to discuss patient care issues. Residents shall assume primary responsibility for managing their patients.

### **Radiation Gastroenterology**

The resident shall learn to prescribe and monitor the different doses and methods of radiation therapy in management of different types of malignancies.

### **Organ Transplantation**

This popular rotation shall provide residents with an intense introduction to the selection of transplant candidates and the management of these patients after transplantation. Residents shall work with a dedicated group of organ transplant physicians and learn the indications, contraindications and the relative protocols and precautions required for these transplantations.

### **Gastroenterological Rehabilitation Rotation**

This rotation shall expose residents to issues in rehabilitation of patients with chronic gastroenteric diseases.

### **Elective Experiences**

Elective experiences in Pathology and Laboratory Medicine as well as Radiology and Infectious Diseases Centre for 1 month each in the relevant departments.

## **RESEARCH/THESIS WRITING**

Total of one year will be allocated for work on a research project with thesis writing. The project must be completed and thesis submitted before the end of training. Research can be done as one block in the 5th year of training or it can be stretched over five

years of training in the form of regular periodic rotations during the course as long as total research time is equivalent to one calendar year.

### **Research Experience**

The active research component program must ensure meaningful, supervised research experience with appropriate protected time for each resident while maintaining the essential clinical experience. Recent productivity by the program faculty and by the residents will be required, including publications in peer-reviewed journals. Residents must learn the design and interpretation of research studies, responsible use of informed consent, and research methodology and interpretation of data. The program must provide instruction in the critical assessment of new therapies and of the surgical literature.

Residents should be advised and supervised by qualified staff members in the conduct of research.

### **Clinical Research**

Each resident will participate in at least one clinical research study to become familiar with:

- Research design.
- Research involving human subjects including informed consent, operations of the Institutional Review Board, and ethics of human experimentation.
- Data collection and data analysis.
- Research ethics and honesty.
- Peer review process.

This usually is done during the consultation and outpatient clinic rotations.

### **Case Studies or Literature Reviews**

- Each resident will write, and submit for publication in a peer-reviewed journal, a case study or literature review on a topic of his/her choice.

### **Laboratory Research**

#### **Bench Research**

- Participation in laboratory research is at the option of the resident and may be arranged through any faculty member of the Division. When appropriate, the research may be done at other institutions.

### **Research involving Radioactivity**

Each resident participating in research involving radioactive materials is required to:

- Attend a Radiation Review session.
- Work with an Authorized User and receive appropriate instruction from him/her.

## **METHODS OF INSTRUCTION/COURSE CONDUCTION**

As a policy, active participation of students at all levels will be encouraged. The following teaching modalities will be employed:

- Lectures.
- Seminar presentation and Journal Club presentations.
- Group discussions.
- Grand rounds.
- Clinico-pathological conferences.
- SEQ as assignments on the content areas.
- Skill teaching in ICU, emergency, and ward settings.
- Attend genetic clinics and rounds for at least one month.
- Attend sessions of genetic counselling.
- Self-study, assignments, and use of internet.
- Bedside teaching rounds in ward.
- OPD & follow-up clinics.
- Long and short case presentations.

In addition to the conventional teaching methodologies, interactive strategies like conferences will also be introduced to improve both communication and clinical skills in the upcoming consultants. Conferences must be conducted regularly as scheduled and attended by all available faculty and residents. Residents must actively request autopsies and participate in formal review of gross and microscopic pathological material from patients who have been under their care. It is essential that residents participate in planning and in conducting conferences.

### **Clinical Case Conference**

- Each resident will be responsible for at least one clinical case conference each month. The cases discussed may be those seen on either the consultation or clinic service or during rotations in specialty areas. The resident, with the advice of the Attending Physician on the Consultation Service, will prepare and present the case(s) and review the relevant literature.

### **Monthly Student Meetings**

Each affiliated medical college approved to conduct training for MD Gastroenterology will provide a room for student meetings/discussions such as:

#### **Journal Club Meeting**

- A resident will be assigned to present, in depth, a research article or topic of

- his/her choice of actual or potential broad interest and/or application.
- Two hours per month should be allocated to discussion of any current articles or topics introduced by any participant.
  - Faculty or outside researchers will be invited to present outlines or results of current research activities.
  - The article should be critically evaluated and its applicable results highlighted, which can be incorporated in clinical practice.
  - Record of all such articles should be maintained in the relevant department.

### **Core Curriculum Meetings**

- All the core topics of Gastroenterology should be thoroughly discussed during these sessions.
- The duration of each session should be at least two hours once a month.
- It should be chaired by the chief resident (elected by the residents of the relevant discipline).
- Each resident should be given an opportunity to brainstorm all topics included in the course and to generate new ideas regarding the improvement of the course structure.

### **Skill Development**

- Two hours twice a month should be assigned for learning and practicing clinical skills.
- List of skills to be learnt during these sessions is as follows:
  - Residents must develop a comprehensive understanding of the indications, contraindications, limitations, complications, techniques, and interpretation of results of those technical procedures integral to the discipline.
  - Residents must acquire knowledge of and skill in educating patients about the technique, rationale and ramifications of procedures, and in obtaining procedure-specific informed consent. Faculty supervision of residents in their performance is required, and each resident's experience in such procedures must be documented by the program director.
  - Residents must have instruction in the evaluation of medical literature, clinical epidemiology, clinical study design, relative and absolute risks of disease, medical statistics and medical decision-making.
  - Training must include cultural, social, family, behavioral, and economic issues, such as confidentiality of information, indications for life support systems, and allocation of limited resources.
  - Residents must be taught the social and economic impact of their decisions on patients, the primary care physician, and society. This can be achieved by attending the bioethics lectures and becoming familiar with Project Professionalism Manual such as that of the American Board of Internal Medicine.
  - Residents should have instruction and experience with patient counseling skills and community education. This training should emphasize effective

communication techniques for diverse populations, as well as organizational resources useful for patient and community education.

- Residents may attend the series of lectures on Nuclear Medicine procedures (radionuclide scanning and localization tests and therapy) presented to the Radiology residents.
- Residents should have experience in the performance of clinical laboratory and radionuclide studies and basic laboratory techniques, including quality control, quality assurance, and proficiency standards.
- Each resident will observe and participate in each of the procedures, preferably done on patients firstly under supervision and then independently.

### **Annual Grand Meeting**

- Once a year all residents enrolled for MD Gastroenterology should be invited to the annual meeting at UHS Lahore.
- One full day will be allocated to this event. All the chief residents from affiliated institutes will present their annual reports.
- Issues and concerns related to their relevant courses will be discussed. Feedback should be collected and suggestions should be sought in order to involve residents in decision making.
- The research work done by residents and their literary work may be displayed.
- In the evening, an informal gathering and dinner can be arranged. This will help in creating a sense of belonging and ownership among students and the faculty.

### **LOG BOOK**

The residents must maintain a log book and get it signed regularly by the supervisor. A complete and duly certified log book should be part of the requirement to sit for MD examination. Log book should include adequate number of diagnostic and therapeutic procedures observed and performed, the indications for the procedure, any complications and the interpretation of the results, routine and emergency management of patients, case presentations in CPCs, journal club meetings and literature review.

### **Proposed Format of Log Book is as follows:**

- Candidate's Name:
- Supervisor:
- Roll No.:
- The procedures shall be entered in the log book as per format.
- Residents should become proficient in performing the related procedures. After observing the technique, they will be observed while performing the procedure and, when deemed competent by the supervising physician, will perform it independently.
- They will be responsible for obtaining informed consent, performing the procedure, reviewing the results with the pathologist and the attending physician,

and informing the patient and, where appropriate, the referring physician of the results.

**Procedures Performed**

<b>Sr. #</b>	<b>Date</b>	<b>Name of Patient, Age, Sex &amp; Admission No.</b>	<b>Diagnosis</b>	<b>Procedure Performed</b>	<b>Supervisor's Signature</b>
1					
2					
3					
4					

**Gastroenterological Emergencies Handled**

<b>Sr. #</b>	<b>Date</b>	<b>Name of Patient, Age, Sex &amp; Admission No.</b>	<b>Diagnosis</b>	<b>Procedure/Management</b>	<b>Supervisor's Signature</b>
1					
2					
3					
4					

**Case Presented**

<b>Sr. #</b>	<b>Date</b>	<b>Name of Patient, Age, Sex &amp; Admission No.</b>	<b>Case Presented</b>	<b>Supervisor's Signature</b>
1				
2				
3				
4				

**Seminar/Journal Club Presentation**

<b>Sr.#</b>	<b>Date</b>	<b>Topic</b>	<b>Supervisor's Signature</b>
1			
2			
3			
4			

## Evaluation Record

(Excellent, Good, Adequate, Inadequate, Poor)

At the end of the rotation, each faculty member will provide an evaluation of the clinical performance of the fellow.

Sr.#	Date	Method of Evaluation (Oral, Practical, Theory)	Rating	Supervisor's Signature
1				
2				

## EVALUATION & ASSESSMENT STRATEGIES

### Assessment

It will consist of action- and professional growth-oriented, student-centered, integrated assessment with an additional component of informal internal assessment, formative assessment, and measurement-based summative assessment.

### Student-Centered Integrated Assessment

It views students as decision-makers in need of information about their own performance. Integrated Assessment is meant to give students responsibility for deciding what to evaluate, as well as how to evaluate it, encourages students to own the evaluation and to use it as a basis for self-improvement. Therefore, it tends to be growth-oriented, student-controlled, collaborative, dynamic, contextualized, informal, flexible and action-oriented.

In the proposed curriculum, it will be based on:

1. Self-Assessment by the Student
2. Peer Assessment
3. Informal Internal Assessment by the Faculty

### Self-Assessment by the Student

Each student will be provided with a pre-designed self-assessment form to evaluate his/her level of comfort and competency in dealing with different relevant clinical situations. It will be the responsibility of the student to correctly identify his/her areas of weakness and to take appropriate measures to address those weaknesses.

## **Peer Assessment**

The students will also be expected to evaluate their peers after the monthly small group meeting. These should be followed by a constructive feedback according to the prescribed guidelines and should be non-judgmental in nature. This will enable students to become good mentors in future.

## **Informal Internal Assessment by the Faculty**

- There will be no formal allocation of marks for the component of Internal Assessment so that students are willing to confront their weaknesses rather than hiding them from their instructors.
- It will include:
  - Punctuality
  - Ward work
  - Monthly assessment (written tests to indicate particular areas of weaknesses)
  - Participation in interactive sessions

## **Formative Assessment**

- Will help to improve the existing instructional methods and the curriculum in use.

## **Feedback to the Faculty by the Students:**

After every three months students will be providing written feedback regarding their course components and teaching methods. This will help to identify strengths and weaknesses of the relevant course, faculty members and to ascertain areas for further improvement.

## **Summative Assessment**

It will be carried out at the end of the programme to empirically evaluate cognitive, psychomotor, and affective domains in order to award degrees for successful completion of courses.

## **Final Examination – MD Gastroenterology**

**Total Marks:** 1500

All candidates admitted in the MD course shall appear in the Final Examination at the end of the structured training programme (end of 5th calendar year) and after clearing the Intermediate Examination.

- There shall be two written papers of 250 marks each,
- Clinical, TOACS/OSCE & ORAL of 500 marks,
- Internal Assessment of 100 marks, and
- Thesis Examination of 400 marks.

## **Topics Included in Paper 1**

- Upper GI Disorders (35 MCQs)
- Lower GI Disorders (35 MCQs)
- Pediatric and Geriatric Gastroenterology (30 MCQs)

## **Topics Included in Paper 2**

- Hepatology (30 MCQs)
- GI Radiology and Other Diagnostic Tests (15 MCQs)
- Gastrointestinal Oncology (20 MCQs)
- Parenteral and Enteral Nutrition (15 MCQs)
- Vascular, Infectious & Immune Disorders (20 MCQs)

## **Components of Final Examination – Theory**

### **Paper I – 250 Marks, 3 Hours**

- 5 SEQs – 50 Marks
- 100 MCQs – 200 Marks

### **Paper II – 250 Marks, 3 Hours**

- 5 SEQs – 50 Marks
- 100 MCQs – 200 Marks

The candidates who pass in theory papers will be eligible to appear in the Clinical, TOACS/OSCE & ORAL.

### **Clinical, TOACS/OSCE & ORAL – 500 Marks**

- Four short cases – 200 Marks
- One long case – 100 Marks
- TOACS/OSCE & ORAL – 200 Marks

**Continuous Internal Assessment:** 100 Marks

**Thesis Examination:** 400 Marks

All candidates admitted in MD courses shall appear in the Thesis Examination at the end of the 5th calendar year of the MD programme. The examination shall include thesis evaluation with defense.

Sr. #	Content	Years of training / Duration
1.	Duration of training	5 years
2.	Curriculum	Per UHS regulations
3.	List of Mandatory workshops	4 mandatory workshops: * Research Methodology & Biostatistics * Synopsis writing * communication skills * Introduction to computer / Information Technology & Software At 3 monthly interval
4.	Rotations	* First 2 years in Medicine with rotation of 2 months each in ICU, CCU & Pulmonology * 3 years training in Gastroenterology & GI Endoscopy * 1 month research electives in year 3 * 1 month rotation in Radiology & Pathology in year 4-5
5.	Synopsis Writing	Should be approved by the end of 2nd year
6.	Intermediate / Abridged exam	Intermediate exam as per UHS regulations by the end of 2nd year
7.	Completion of Thesis	6 months before completion of training
8.	Submission of Thesis	At least 6 months prior to completion of training
9.	Evaluation & Acceptance of Thesis	Evaluation should be done within 2 months period
10.	Final examination	After completion of training, passing Intermediate exam, fulfilling internal assessment criteria & Thesis acceptance

Sr. #	Content	Years of training / Duration
11.	Degree Award	After passing the Final exam
12.	Addition by RMU	<ul style="list-style-type: none"> <li>* Annual lectures</li> <li>* 6 monthly TOACS</li> <li>* 6 monthly MCQ based exam</li> <li>* Workshops on: <ul style="list-style-type: none"> <li>- Professionalism</li> <li>- Clinical Audit</li> <li>- BLS</li> <li>- ACLS</li> </ul> </li> </ul>