PROGRAM

DM

GASTROENTEROLOGY
Contents

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AIM:

Disorders of Gastrointestinal tract and hepatobiliary system constitute one of the major causes of morbidity and mortality in Kerala state. Based on this there is a necessity to provide physicians with all necessary skills towards acquisition of qualification in gastroenterology so that he can manage disorders with competence.

OBJECTIVES:

1. Train Gastroenterologist with adequate knowledge and skills to tackle efficiently with all disorders of gastrointestinal tract and hepatobiliary system
2. Train candidates to perform research and emphasize the research oriented approach to new problems
3. Graduate the students at an internationally accepted standard
4. Train them with value based attitude and medical ethics
5. Train candidates to realize the importance of team approach to medical problems

Specific Objectives:

1. To train them so that they require enough scientific knowledge in the gastrointestinal and hepatobiliary practice to make appropriate clinical decisions in the management of patients
2. Gain skills in diagnostic and therapeutic procedure in gastroenterology and hepatobiliary system
3. Acquire skills in organizing and conducting research projects.
4. Educate and update themselves and colleagues in gastroenterology.
5. Advise colleagues from other subspecialty in GE-related problems.

COURSE CONTENTS:

SYLLABUS

BASIC SCIENCES RELATED TO GASTROENTEROLGY

Basic Mechanisms of Normal and Abnormal Gastrointestinal Function

The Integrated Response of the Gastrointestinal Tract to a Meal

Cephalic and Oral Phases
Esophageal Phase
Gastric Phase
Duodenal Phase
Small Intestinal Phase
Colonic Phase

The Enteric Nervous System and Its Extrinsic Connections

Structural Organization of the Enteric Nervous System
Microscopic Structure of the Enteric Nervous System
Histochemical Profiles and Transmitter Multiplicity of Enteric Neurons
Physiologic Characteristics of Enteric Neurons
Functionally Defined Enteric Neurons
Extrinsic connections
Enteric Pathways for Motility Control
Interstitial Cells of Cajal
Enteric Pathways for Secretomotor Control
Sympathetic Enteroenteric Inhibitory Reflexes

Gastrointestinal Hormones and Receptors

Organization of the Gut Endocrine System
History of Gastrointestinal Endocrinology
Hormone Secretory Cells
Endocrine Cell Localization and Characterization
Biosynthesis and Processing of Gastrointestinal Hormones
Hormone and Transmitter Molecules
Measurement of Hormones
Receptors
Receptor characterization and Quantification
Hormone-Specific Insights
Hormones in Gastrointestinal Disease

The Brain – Gut Axis

Developmental Biology of the Brain – Gut Axis
Methods for studying the Brain – Gut Axis
Brain –Gut Connections
Signaling from Gut to Brain
Efferent Functions of Peptidergic Visceral Afferent Neurons
CNS Control of the Gut
Vagovagal Reflux Mechanisms
Satiety Mechanisms

Smooth Muscle of the Gut

Structure of the Smooth Muscle
Interaction of Contractile Proteins
Mobilization of Activator Calcium
Electrical Properties of Smooth Muscle
Rhythmic Electrical Activity of Smooth Muscle
Neural Regulation of Smooth Muscle by the Myenteric Plexus
Hormonal Regulation of Smooth Muscle Function
Humoral Regulation of Smooth Muscle Function

The Immune System

Properties of the Immune System
Components of the Immune System
Cellular Interactions in the Immune Systems
Gut-Associated Lymphoid Tissue
Autoimmunity and Oral Unresponsiveness

Gastrointestinal Inflammation
Leukocyte Trafficking and Adhesion Molecules
Leukocyte Chemotaxis and Activation
Cytokines
Lipid Mediators of Inflammation
Nitric Oxide
Epithelial Cells
Inflammation and Epithelia; Cell Gene Expression
Mast Cells
Motility

Epithelia: Biologic Principles of Organization

Organization of the Gut Wall
Organization of Epithelial Sheets
Epithelial Barriers
Epithelial Responses to Disease and Injury

Esophageal Motor Function

Innervation
Pharynx and Oropharynx
Upper Esophageal Sphincter
Esophagus
Lower Esophageal Sphincter

The Physiology of Gastric Motility and Gastric Emptying

Smooth Muscle Characteristics of the Stomach
Innervation of the Stomach
Regional Motor Patterns in the Stomach and Duodenum
Gastric Emptying

Motility of the Small Intestine and Colon

Anatomic Considerations
Smooth Muscle of the Small Intestine and Colon
Innervation of the Small Intestine and Colon
Physiologic and Pathophysiologic Motor Patterns During a Basal Fasting State
Physiologic and Patjhophysiologic Modulators of Small Intestine and
Colon

Motility

Correlation of Motor Pattern With Transit in the Small Intestine and Colon
Sphincteric Function of the Lower Gastrointestinal Tract

Motility of the Biliary Tree
Anatomic Considerations and Species Variation
Functional Considerations
Mechanisms of Physiologic Regulation and of Pathologic Changes

Salivary Secretion

Salivary Glands and Salivary Secretions
Morphology
Reflux Arch for Salivary Secretion
Stimulus- Secretion Coupling
Secretion of Electrolytes and Water From Acini
Ductal Fluid Modification
Regulation of Salivary Protein Secretion
Salivary Protein
Buffer Systems of Saliva
Salivary Dysfunction

Gastric Secretion

Anatomy of Gastric Mucosa
Regulation of Acid Secretion
Cellular Basis of Acid Secretion
Other Gastric Secretory Products
Clinical Implications of Gastric Secretion

Electrolyte Secretion and Absorption: Small Intestine and Colon

The Intestinal Epithelium
Principles of Epithelial Transport
Electrolyte Transport Proteins
Transepithelial Electrolyte Transport
Regulation of Electrolyte Transport
Pancreatic Secretion

- Formation and Composition of Pancreatic Juice
- Stimulation of Pancreatic Secretion
- Intracellular Control of Pancreatic Secretion
- Inhibition Control of Pancreatic Secretion
- Patterns of Secretion

Bile Secretion

- Bile Composition
- Morphologic Considerations
- Physiologic Considerations
- Bile Acid – Dependent Bile Formation
- Bile Acid – Independent Bile Formation
- Para cellular Pathway
- Regulation of Bile Secretion
- Bilirubin transport
- Biliary Excretion of Drugs
- Biliary Lipid Secretion
- Acinar Heterogeneity
- Ductular Events
- Gallbladder Structure and Function
- Enterohepatic Circulation
- Clinical Correlates

Carbohydrate Assimilation

- Chemistry and Structure of Carbohydrates
- Dietary Carbohydrates
- Dietary Fiber
- Carbohydrate Assimilation
- Lumenal Phase of Digestion: Starch Hydrolysis
- Brush Border Carbohydrases
- Absorption of Monosaccharides
- Spatial Localization of Hydrolysis and transport Along the Crypt – Villus Axis
- Efficiency and Rate – Limiting Steps of Carbohydrate Assimilation
Intestinal Lipid Absorption

Intestinal Lipid Balance
Intraluminal Lipid Digestion
Intracellular Events in Lipid Reassembly
Intestinal Lipoprotein Assembly and Secretion
Lipid Absorption in Malabsorptive States

Protein Digestion and Assimilation
Aspects of Dietary Proteins
Digestion of Proteins
Absorption of Protein Digestion Products
Fate of Absorbed Protein Digestion Products
Physiologic and Clinical Significance
Regulation of Amino Acid and Peptide Absorption
Protein-Energy Malnutrition
Defects in Digestion and Absorption of Proteins

Vitamin and Mineral Absorption

Absorption of Water-Soluble Vitamins
Absorption of Fat-Soluble Vitamins
Absorption of Minerals
Localization of Vitamin and Mineral Absorption

General Nutritional Principles

Basic Nutritional Principles
Altered Nutritional States

Gastrointestinal Blood Flow

Anatomy of Gastrointestinal Circulation
Techniques of Measurement of Blood Flow
Basal Hemodynamics and Oxygenation
Blood Flow Regulation
Physiology and Biochemistry of Ischemia
Growth and Development of The Gastrointestinal Tract

   Embryology and Histogenesis
   Functional Maturation
   Transcriptional Regulation of Development
   Growth and Differentiation in the Mature Gastrointestinal tract

Neoplasia of the Gastrointestinal tract

   Normal Cellular Control Mechanisms
   Molecular Carcinogenesis
   Tumor Formation and Behavior
   Clinical Markers of Neoplasia

The Barrier Function of the Gut

   The Functional Anatomy of the Gastrointestinal Barrier
   The Metabolic Barrier of the Gastrointestinal Tract
   Metabolites Generated within the Enterocytes Pharmacology of the Gut

The Gastrointestinal Biota

   Composition of the Biota
   Metabolism
   Host Defence Function
   Antibiotic Effects on gastrointestinal Biota
   Interactions of Biota and Host

GASTROINTESTINAL DISEASES

Esophagus

Esophagus: Anatomy and Structural Anomalies

   Embryology
   Adult Anatomy
   Histology
   Developmental Anomalies
   Pharyngoesophageal Diverticula
   Esophageal Diverticula
   Esophageal Hiatal Hernias
Motility Disorders of the Esophagus

Oropharyngeal Swallowing Disorders
Esophageal Motility Disorders

Reflux Esophagitis

Epidemiology
Etiology
Potency of the Reflux
Esophageal Defences
Conditions Associated With Reflux
Clinical Manifestations
Diagnostic Studies and Differential Diagnosis
Clinical Course and Complications
Therapy
Gastroesophageal Reflux In Infants and Children
Alkaline Reflux Esophagitis

Esophageal Infections, Including Disorders Associated with AIDS

Epidemiology and Predisposing Factors
Fungal Infections
Viral Infections
Mycobacterial Infections
Bacterial Infections
Protozoal Infections
Specific HIV-Related-Esophageal Disorders

Esophageal Neoplasms

Squamous Cell Carcinoma
Esophageal Adenocarcinoma
Other Epithelial Tumors
Nonepithelial Tumors
Overall Summary and Future Directions

Miscellaneous Diseases of the Esophagus
Foreign Bodies in the Esophagus
Systemic Diseases Affecting the Esophagus
Dermatologic Diseases Affecting the Esophagus
Esophageal Trauma
Pill Esophagitis

Stomach

Stomach: Anatomy and Structural Anomalies

Anatomy of the Stomach and Duodenum
Gross Anatomy
Microscopic Anatomy
Embryology of the Stomach and Duodenum
Congenital Abnormalities of the Stomach
Hypertrophic Pyloric Stenosis
Congenital Abnormalities of the Duodenum

Disorders of Gastric Emptying

Disorders With Delayed Gastric Emptying
Disturbances of the Gastric Electrical Pacemaker
Disorders With Rapid Gastric Emptying
Functional Dyspepsia

Acid Peptic Disorders

Impact of Peptic Ulcer Disease
Epidemiology and Natural History
Pathophysiology of Peptic Ulcer Disease
Clinical Manifestations and Differential Diagnosis
Diagnostic Studies in Peptic Ulcer Disease
Therapy for Ulcer Disease

Zollinger-Ellision Syndrome

Epidemiology
Pathophysiology
Tumor Distribution
Clinical Manifestations
Differential Diagnosis and Diagnostic Studies
Tumor Localization
Therapy
Prognosis

Gastritis, Gastropathy, Duodenitis, and Associated Ulcerative Lesions

Classification of Gastritis and Gastropathy
Approaches to Diagnosis of Gastritis and Gastropathy
Common forms of Gastritis and Gastropathy
Pathology of Gastric Ulceration in Relation to Chronic Gastritis
Uncommon Forms of Chronic Gastritis
Chronic Duodenitis and Duodenal Ulcer

Tumors of the Stomach

Epidemiology
Etiology
Clinical Manifestations
Diagnosis
Clinical Course
Treatment
Other Gastric Tumors

Surgery For Peptic Ulcer Disease and Postgastrectomy Syndromes

Elective Surgery for Peptic Ulcer Disease
Surgery for Duodenal Ulcer
Surgery for Gastric Ulcer
Surgical Treatment for Peptic Ulcer Complications
Complications of Surgery for Peptic Ulcer

Miscellaneous Disease of the Stomach

Gastric Bezoars
Foreign Bodies
Gastric Rupture
Gastric Volvulus

Small Intestine

Small Intestine: Anatomy and Structural Anomalies

Gross Anatomy
Microscopic Anatomy
Embryology
Congenital Anomalies
Structural Anomalies

Dysmotility of Small Intestine

Epidemiology
Etiology
Clinical Manifestations
Complications
Diagnostic Studies
Differential Diagnosis Between Chronic Intestinal Pseudoobstruction and Mechanical Obstruction
Treatment

Small Intestine: Infections With Common Bacterial and Viral Pathogens

Food Poisoning and Common Source Outbreaks
Traveler’s Diarrhea
Bacterial Infection
Viral Pathogens
Therapeutic Considerations

Chronic Infections of the Small Intestine

Tuberculosis
Whipple Disease
Tropical Sprue
Mycotic Infections

Celiac Disease
Definition
History
Epidemiology
Pathology
Cereal Chemistry
Toxicity Studies
Hypothesis for Pathogenesis
Genetics
Clinical Features
Laboratory Tests
Diagnostic Tests
Disease Associations
Treatment

Disorders of Epithelial Transport in the Small Intestine

Defects in Intestinal Carbohydrate Transport
Disorders of Amino Acid Absorption
Disorders of Electrolyte and Mineral Transport
Primary Bile Acid Malabsorption
Disorders of Lipid Malabsorption
Defects in Intestinal Cobalamin Absorption
Disorders of Lactose and Sucrose Absorption

Bacterial Overgrowth

Conditions Favoring Bacterial Overgrowth
Pathogenesis
Pathology
Clinical Manifestations
Diagnosis
Treatment

Short Bowel Syndrome

Etiology
Factors Influencing Short Bowel Syndrome
Clinical Manifestations
Management
Tumors and other Neoplastic Diseases of the Small Intestine

Epidemiology
Etiology: Possible Pathophysiologic Mechanisms
Clinical Manifestations of Small Bowel Tumors
Differential Diagnosis
Diagnostic Modalities
Varieties of Small Bowel Tumor

Miscellaneous Disease of the Small Intestine

Ulcers of the Small Intestine
Drug-Induced Small Bowel Disease
Necrotizing Enterocolitis
Protein-Losing Gastroenteropathy

Colon
Colon: Anatomy and Structural Anomalies

Colonic Development
Histology Anatomy
Structural and Congenital Abnormalities

Inflammatory Bowel Disease

Epidemiology
Etiology and Pathogenesis
Ulcerative Colitis: Clinical Findings and Natural History
Crohn’s Disease: Clinical Findings and Natural History
Extraintestinal Manifestations
Pathology
Radiography
Endoscopy
Differential Diagnosis
Nutritional Management
Drugs Used in Inflammatory Bowel Disease
Medical Management of Ulcerative Colitis
Medical Management of Crohn’s Disease
Surgical Management
Complications of Ulcerative Colitis
Complications of Crohn’s Disease
Colon Cancer, Dysplasia, and Colonoscopic Surveillance
Pregnancy and Inflammatory Bowel Disease
Inflammatory Bowel Disease in Childhood and Adolescence

Surgical Treatment of Inflammatory Bowel Disease

Chronic Ulcerative Colitis
Crohn’s Disease

Miscellaneous Inflammatory and Structural Disorders of the Colon

Collagenous and Lymphocytic Colitis
Diversion Colitis
Endometriosis
Drug-and Chemical-Induced Colonic Injury
Colonic Ulcers
Typhitis
Coitis Cystica Profunda
Pneumatosis Cystoides Intestinalis
Malakoplakia

Irritable Bowel Syndrome

Definition
Societal Impact of Irritable Bowel Syndrome
Epidemiology of Irritable Bowel Syndrome
Clinical Features of Irritable Bowel Syndrome
Pathophysiology of Irritable Bowel Syndrome
Diagnostic Approach to the Patient With Presumed Irritable Bowel Syndrome

Treatment of Irritable Bowel Syndrome
Approach to Different Subsets of Patients With Irritable Bowel Syndrome
Patient Outcome in Irritable Bowel Syndrome

Motility Disorders of the Colon
Absorptive and Motor Functions of the Colon
Potential Pathogenic Mechanisms
Syndromes Generally Attributed to Disorders of Colonic Motility
Colonic Pseudoobstruction and Megacolon

Diverticular Disease of the Colon

Epidemiology
Etiopathogenesis
Pathophysiology
Natural History
Diverticular Diseases

Bacterial Infections of the Colon

Shigella Infection
Campylobacter Infection
Clostridium difficile Colitis
Colitis Secondary to Escherichia Coli Infection
Sexually Transmitted Enteric Infections

Neoplastic and Nonneoplastic Polyps of the Colon and Rectum

Epidemiology
Etiology and Pathogenesis
Adenoma-Carcinoma Sequence
Primary prevention
Clinical Manifestations
Clinical Features of Neoplastic Polyps
Clinical Features of Nonneoplastic Polyps
Screening of Adenomas
Diagnosis of Adenomas
Natural History
Therapy
Follow-up for Metachronous Adenomas and Cancer
Impact of Polypectomy on Colorectal Cancer Incidence and Mortality

Polyposis Syndromes

Adenomatous Polyposis Syndromes
Hamartomatous Polyposis Syndromes
Noninherited Polyposis Syndromes

Malignant Tumors of the Colon

Epidemiology
Geographic Patterns
Dietary Patterns
Etiology
Clinical Manifestations and Risk Factors for Colorectal Neoplasia
Pathology
Differential Diagnosis
Diagnostic Approaches to Colon Cancer
Surveillance for Colorectal Cancer Among High-Risk Groups
Clinical Course and Complications
Treatment
Other Tumors of the Large Intestine

Anorectal Diseases

Anorectal Examination
Hemorrhoids
Anorectal Abscess and Fistula
Rectal Prolapse
Anal Fissure
Anal Stenosis
Solitary Rectal Ulcer
Fecal Incontinence
Pruritus Ani
Rectal Foreign Bodies and Trauma
Anal Carcinoma
Hidradentis Suppurativa
Pilonidal Disease
Proctalgia Fugax and the Levator Syndrome
Miscellaneous Causes of Chronic Anorectal Pain

Pancreas

Pancreas: Anatomy and Structural Anomalies
Embryologic Development
Gross Anatomy
Surgical Exposure
Arterial Blood Supply
Venous Drainage
Lymphatic Drainage
Nerve Supply
Ductal System
Ultrastructure
Congenital Anomalies

Acute Pancreatitis

Incidence
Classification
Pathology
Pathophysiology
Experimental Models
Specific Etiologies
Diagnosis
Evaluation of Severity
Acute treatment
Complications

Chronic Pancreatitis

Incidence and Prevalence
Etiology
Clinical Presentation
Pathomechanism of Symptoms
Diagnosis
Complications
Treatment

Pancreatic Adenocarcinoma

Ductal Adenocarcinoma of the Pancreas
Epidemiology
Molecular Genetics
Pathology
Clinical Manifestations
Physical Findings
Diagnostic Investigations
Rationale of the Workup in Patients With Suspected Pancreatic Cancer
Treatment
Surgical Palliation
Nonsurgical Palliation of Biliary and Duodenal Obstruction
Malabsorption
Pain
Adjuvant Therapy
Prognosis
Less Common Exocrine Pancreatic Tumors

Endocrine Neoplasms of the Pancreas

Epidemiology
Pathology
Clinical Features and Diagnosis
Tumor Localization
Treatment

Hereditary Diseases of the Pancreas

Cystic Fibrosis
Hereditary Pancreatitis
α 1-Antitrypsin Deficiency
Shwachman Syndrome
Johanson-Blizzard Syndrome
Sideroblastic Anemia and Pancreatic Insufficiency
Isolated Pancreatic Enzyme Deficiencies

Gallbladder and Biliary Tree

Gallbladder and Biliary Tree: Anatomy and Structural Anomalies

Embryologic Development
Anatomy of the Gallbladder
Anatomy of the Extrahepatic Biliary Ducts
Congenital Variations and Malformations
Gallstones

Epidemiology
Etiology
Clinical Manifestations
Differential Diagnosis
Clinical Course and Complications
Treatment
Acalculous Cholecystitis

Diseases of the Biliary Tree
Calculus Diseases of the Bile Duct
Biliary Cysts
Sclerosing Cholangitis
Miscellaneous Causes of Bile Duct Obstruction
Biliary Fistula
Biliary Tract Disease Associated With Acquired Immunodeficiency Syndrome

Tumors of the Biliary Tree
Cholangiocarcinoma
Benign Bile Duct Tumors
Carcinoma of the Gallbladder
Benign Tumors of the Gallbladder

Sphincter of Oddi Dysfunction

Definitions
Anatomy, Physiology and Pathophysiology
Epidemiology and Frequency
Typical Clinical Presentation
Diagnostic Methods (Noninvasive)
Diagnostic Methods (Invasive)
Therapy for Sphincter of Oddi Dysfunction
Sphincter of Oddi Dysfunction in Recurrent Pancreatitis
Failure to Achieve Symptomatic Improvement After Biliary Sphincterotomy
Abdominal Cavity

Abdominal Cavity: Anatomy, Structural Anomalies and Hernias

  Embryology of the Abdominal Cavity
  Anatomy of the Abdominal Cavity
  Herniation in the Adult
  Internal Hernias
  Isthrogenic Hernias

Intraabdominal Abscesses and Fistulas

  Intraabdominal Abscesses
  Gastrointestinal Fistulas

Diseases of the Mesentery and Omentum

  Embryology, Anatomy and Physiology
  Mesenteric Panniculitis and Retractile Mesenteritis
  Mesenteric Fibromatosis
  Mesenteric and Omental Cysts
  Solid Tumors of the Omentum and Mesentry
  Omental Vascular Accident
  Granulomatous Infection
  Surgical Uses of the Omentum

Diseases of the Peritoneum

  Peritoneum
  Retroperitoneum

Miscellaneous

  Epidemiology
  Role of the Intestine in HIV-1 Infection
  Diarrheal Diseases
  Abdominal Pain
  Hepatobiliary Disorders
  Pancreatitis
  Gastrointestinal Bleeding
Anorectal Disease

Parasitic Diseases: Protozoa

Extracellular Protozoan Parasites
Intracellular Protozoan Parasites (Coccidia)

Parasitic Diseases: Helminths

Intestinal Nematodes (Roundworms)
Cestodes (Tapeworms)
Trematodes (Flukes)

Gastrointestinal Manifestations of Specific Genetic Disorders

Considerations of Applied Genetics in Gastroenterology
Genetic Disorders With Prominent Gastrointestinal Presentations
Malabsorption Disorders
Chronic Diarrhea Syndromes Not Characterized by Malabsorption
Recurrent Gastrointestinal Bleeding Syndromes
Intestinal Motility or Pseudoobstruction Disorders
Mechanical Obstruction and Malformation Syndromes
Gastrointestinal Neoplasm Syndromes
Common Gastrointestinal Disorders With Complex Genetic Causes
Pernicious Anemia and Atrophic Gastritis
Gluten-Sensitive Enteropathy
Inflammatory Bowel Disease
Gallstones

Gastrointestinal Manifestations of Systemic Diseases

Cardiovascular Diseases
Chromosomal Abnormalities and other Genetic Disorders
Dermatologic Diseases
Endocrinologic Diseases
Granulomatous Diseases
Heavy Metal Toxicity
Hematologic Disorders
Metabolic Disorders
Neoplastic Disorders
Neuromuscular Disorders
Nutritional Disturbances
Organ Transplantation and Complications
Pregnancy
Physiological Disorders
Pulmonary Disorders
Renal Disorders
Substance Abuse
Vasculitides

Gastrointestinal Manifestations Immunologic Disorders

Immunodeficiency Disease and the Gut
Classification of Immunodeficiency Disorders
Food Allergy (Hypersensitivity)
Eosinophilic Gastroenteritis
Gastrointestinal Complications of Organ Transplantation
Small Bowel Transplantation

Vascular Lesions: Ectasis, Tumors and Malformations

Vascular Ectasia Disorders
Vascular Tumors
Other Vascular Lesions

Mesenteric Ischemia

Anatomy of the Intestinal Circulation
Structure and Functions of the Intestinal Microcirculation
Regulation of Blood Flow
Pathophysiology of Mesenteric Ischemia
Pathology of Intestinal Ischemia
Clinical Issues

Radiation Injury

Radiation Pathobiology
Pathology
Specific Organ Involvement
Prevention of Radiation Injury

Diagnostic and Therapeutic Modalities in Gastroenterology

Clinical Decision Making

What is Evidence-Based Medicine?  
Critical Appraisal of an Article About a Diagnostic Test  
Clinical Appraisal of an Article About a Therapy

Molecular Biologic Approaches to the Diagnosis of Gastrointestinal Diseases

Molecular Methods in the Diagnostic Laboratory
Molecular Applications for Gastrointestinal Infectious Diseases
Diagnosis of Nonmalignant Inherited Gastrointestinal Disorders
Inherited Gastrointestinal Neoplastic Disorders
Molecular Testing for Acquired Gastrointestinal Disease
Future of Molecular Diagnostics in Gastroenterolgy

Reprocessing of Gastrointestinal Endoscopes and Accessories

Transmission of Infection Through Endoscopy
Sterilization and Levels of Disinfection
Essential Concepts in Reprocessing in Endoscopes and Accessories
Compliance with Recommendations for Endoscope Reprocessing
Future Trends

Sedation and Monitoring for Gastrointestinal Endoscopy

Conscious versus Deep Sedation: Definitions and JCAHO Regulations
Cardiopulmonary Complications of Endoscopy
Monitoring
Drugs for Endoscopy
Approach to Sedating the Patient for Endoscopy

Upper Gastrointestinal Endoscopy

Technical Considerations
Accessories and Methods for Special Applications
Patient Preparation
Indications for Upper Endoscopy
Endoscopic Surveillance for Premalignant Lesions
Risks and Contraindications
Assessment of Results
Trends

Enteroscopy

Push Enteroscopy
Sonde Enteroscopy
Intraoperative Enteroscopy

Colonoscopy and Flexible Sigmoidoscopy

Technical Considerations
Anatomic Basis of Colonoscopy
Bowel Preparation
Monitoring During Endoscopy
Colonoscopy From the Patient’s Point of View
Colonoscopy Procedure
Therapeutic Procedures
Indications
Contraindications and Risks
Comparison With Barium Enema
Limitations of Colonoscopy
Costs
Future Developments

Endoscopic Retrograde Cholangiopancreatography, Endoscopic Sphincterotomy and Stone Removal, and Endoscopic Biliary and Pancreatic Drainage

Endoscopic Retrograde Cholangiopancreatography
Bile Duct Stones
Biliary Drainage Procedures
Pancreatic Drainage Procedures
Pancreas Divisum

Endoscopic Mucosal Biopsy
Technical Considerations
Indications for and Interpretations of Endoscopic Biopsy
Contraindications and Risks
Cost Effectiveness

Microbiologic Studies

Microbiologic Techniques for Diagnosing Classes of Pathogens
Techniques for Microbiologic Evaluation of Gastrointestinal and Hepatobiliary Systems
Indications
Contraindications and Risks
Interpreting Positive and Negative Test Results
Costs
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Gastrointestinal Dilatation and Stent Placement

Theoretical Considerations
Technical Applications
Indications
Contraindications and Risks
Assessment of Results
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Percutaneous Endoscopic Gastrostomy

Methods
Indications
Contraindications
Complications
Feeding
Percutaneous Endoscopic Jejunostomy
Removal and Replacement of PEGs

Endoscopic Therapy for Upper Gastrointestinal Variceal Hemorrhage

Anatomic Considerations
Natural History of Variceal Bleeding
Techniques
Mechanism of Action
Efficacy
Contraindications and Risks
Summary and Future Development

Endoscopic Control of Nonvariceal Upper Gastrointestinal Hemorrhage

Patient Selection
Early Refeeding and Adjunctive Measures
Principles of Hemostasis
Indications, Contraindications and Timing of Endoscopy
Methods and Techniques
New Techniques for Nonvariceal Upper Gastrointestinal Hemorrhage
Clinical Results and Costs
Future Developments

Endoscopic Therapy for Polyps and Tumors

Methods of Endoscopic Therapy
Endoscopic Tissue Staining and Tattooing
Goals of Endoscopic Therapy
Rationale for Endoscopic Therapy Versus other Modalities
Precursor Lesions
Patient Selection for Endoscopic Treatment
Failure of Endoscopic Therapy
Esophageal Lesions
Gastric Lesions
Duodenal Lesions
Colorectal Polyps and Tumors

Evaluation of Gastrointestinal Motility: Methodologic Considerations

Esophageal Manometry and 24-Hour pH Monitoring
Gastroduodenal Manometry
Electrogastrography
Electronic Barostat and Its Application in Evaluating Gastrointestinal Sensor / Motor Function
Anorectal Manometry
Future Applications
Tests of Gastric and Exocrine Pancreatic Function and Absorption

Tests of Gastric Secretory Function
Tests of Pancreatic Exocrine Function

Plain and Contrast Radiology

Abdominal Plain Films
Technique
Abnormalities
Contrast Studies
Pharynx
Upper Gastrointestinal Tract
Small Bowel
Colon

Cross-Sectional Anatomy

Abdominal Cavity
Pelvic Anatomy

Ultrasonography

Introduction
Liver
Gallbladder
Bile Ducts
Pancreas
Gastrointestinal Tracts
Peritoneal Cavity
Intraoperative Sonography

Endoscopic Ultrasonography

Technical Considerations
Endoscopic Ultrasonography for Upper Gastrointestinal Tract
Endoscopic Ultrasonography of Organs Adjacent to the Upper Gastrointestinal Tract
Transrectal Ultrasonography
Endoscopic Ultrasonography-Guided Biopsy
Established Indications
Future Trends

Applications of Computed Tomography to the Gastrointestinal Tract

The Hollow Viscera of the Gastrointestinal Tract
The Solid Organs of the Gastrointestinal Tract
Peritoneum
Future Directions

Magnetic Resonance Imaging

Basic Principles
Liver
Biliary Tree
Pancreas
Intestine
Imaging Recommendations
Future Directions

Positron Emission Tomography

Fundamental Theory
Technical Considerations
Systems Imageable by Positron Emission Tomography
Clinical Applications in Gastroenterology
Costs and Risks

Applications of Radionuclide Imaging in Gastroenterology

Theoretical Considerations
Technical Applications
Imaging Applications’
Nonimaging Uses of Radiotracers

Angiography

Technical Considerations
Risks and Contraindications
Vascular Anatomy of the Abdominal Viscera
Anterai Disease
Venous Disease
Gastrointestinal Disease
Pancreatic Disease
Hepatic Disease
Panhepatic Angiography
Transcatheter Therapy
Forthcoming Advances

Interventional Radiology

Vascular Intervention
Transjugular Intrahepatic Portosystemic Shunt
Biliary Intervention
Percutaneous Biopsy
Percutaneous Abscess and Fluid Collection Drainage
Percutaneous Gastrointestinal Intervention

Laprosopy and Laprotomy

History of Laproscopy
Diagnostic Laproscopy
Technique of Laproscopic Abdominal Exploration
Abdominal Inspection
Indication for Diagnostic Laproscopy
Thrapeutic Laproscopy
Laprotomy
Procedure

Liver

Anatomy and Developmental Anomalies of the Liver

Surface Anatomy
Segmental Anatomy
Variation in Surface Anatomy
Large Vessels of the Liver
Lymph Vessels
Nerve Supply
Biliary System
Microanatomy

Liver Physiology and Metabolic Function

Hepatic Architecture
Excretory Pathway
Introduction to Liver Metabolism
Carbohydrate Metabolism
Synthesis and Metabolism of Fatty Acids
Lipid Transport
Liver Disease and Lipid Abnormalities
Serum Proteins Synthesized by the Liver
Hepatic Regeneration
Apoptosis

Inherited Metabolic Disorders of the Liver

α1-Antitrypsin Deficiency
Glycogen Storage Disease
Porphyrias
Tryosinemia
Urea Cycle Defects
Bile cid Biosynthesis Defects
Byler Syndrome
Cystic Fibrosis

Hereditary Hemochromatosis

Cause of Iron Overload

Pathophysiology
Clinical Manifestations
Diagnosis
Treatment and Prognosis
Family Screening

Wilson’s Disease
Clinical Features
The Copper Pathway
The Basic Molecular Defect
Diagnosis
Pathology
Treatment
Prognosis

Biochemical Liver Tests

Viral Hepatitis A Through G

Hepatitis A Virus
Hepatitis B Virus
Hepatitis C Virus
Hepatitis D Virus
Hepatitis E Virus
Hepatitis G Virus and the GB Agents

Liver Abscesses and Bacterial, Parasitic, Fungal and Granulomatous Liver Disease

Liver Abscess
Bacterial and Spirochetal Infections of the Liver
Parasitic Disease that Involve the Liver
Fungal Liver Disease
Granulomatous Liver Disease

Vascular Diseases of the Liver

Budd-Chiari Syndrome
Veno-Occlusive Disease
Portal Vein Thrombosis
Ischemic Hepatitis
Congestive Hepatopathy
Peliosis Hepatis
Hepatic Artery Aneurysm
Atherosclerosis
Polyarteries Nodosa
Polymyalgia Rheumatica

Alcoholic Liver Disease

Epidemiology
Ethanol Metabolism
Pathogenesis of Alcoholic Liver Injury
Cofactors Influencing the Development of Alcoholic Liver Disease
Diagnosis
Complications
Treatment
Prognosis

Nonalcoholic Steatohepatitis and Focal Fatty Liver

Nonalcoholic Steatohepatitis
Focal Fatty Liver

Liver Disease Caused by Drugs, Anesthetics and Toxins

Definitions and General Importance of Drugs and Toxins as Causes of Liver Disease
Epidemiology
Pathophysiology
Clinicopathologic Features of Drug-Induced Liver Disease
Prevention and Management
Dose-Dependent Hepatotoxicity
Drug-Induced Acute Hepatitis
Chronic Hepatitis
Liver Disease Caused by Anesthetic Agents and Diagnosis of Jaundice
   In the Postoperative Period
Drug-Induced Cholestasis
Chronic Cholestasis
Liver Disease Caused by Anesthetic Agents and Diagnosis of Jaundice
In the Postoperative Period
Drug-Induced Fibrosis and Cirrhosis
Vascular Toxicity
Liver Tumors
Nonproprietary Medications and Environmental Agents

Pregnancy Related Hepatic and Gastrointestinal Disorders

Liver Problems Unique to Pregnancy
Liver Problems Complicating Pregnancy
Gastrointestinal Problems

Autoimmune Hepatitis

Diagnostic Criteria
Pathogenesis
Sub classifications
Variant Forms
Prevalence
Prognostic Indices
Clinical Manifestations
Treatment
Treatment Results
Future Directions

Primary Biliary Cirrhosis

Epidemiology
Pathogenesis
Clinical Features
Diagnosis
Differential Diagnosis
Associated Diseases
Complications
Management Natural History and Prognosis

Portal Hypertension and Gastrointestinal Bleeding

Etiology and Pathophysiology of Portal Hypertension
Anatomic Sites of Collateral Formation and Bleeding
Natural History and Prognosis of Variceal Hemorrhage
Diagnosis
Management

Ascites and Spontaneous Bacterial Peritonitis

Pathogenesis of Ascites Formation
Clinical Features of Ascites
Complications of Ascites
Treatment of Ascites
Summary of Treatment in Cirrhotic Ascites
Prognosis

Systemic Complications of Liver Disease

Hepatic Encephalopathy
Pulmonary Syndromes
Hepatorenal Syndromes
Endocrine Dysfunction
Coagulation Disorder

Fulminant Hepatic Failure

Definition
Causes
Clinical Presentation
Differential Diagnosis
Predictors of Outcome
Management

Hepatic Tumors and Cysts

Hepatic Tumors
Tumor-Like Lesion
Hepatic Cysts
Approach to the Patient With Hepatic Mass Lesions

Hepatic Manifestations of Systemic Disease and Other Disorders of the Liver
Hematologic Malignancies
Hepatic Sarcoidosis
Hepatic Amyloidosis
Sickle Cell Disease Involving the Liver
Hepatic Dysfunction During Systemic Infection
Postoperative Chloestasis
Liver Abnormalities in Rheumatoid Arthritis
Nodular Disorders of the Liver

Liver Transplantation

Patient Selection for Liver Transplantation
Controversies in Patient Selection
Patient Selection Summary
Post-Transplantation Management
Complications Related to Immunosuppression
Post-Transplantation Summary

Soft Skills (Code DMGA5)

CO1: Competence to do clinical research.

CO2: Attitude to work as a member of a healthcare team.

CO3: Skill in teaching graduate and post graduate students.

CO4: Communication skills - with patients, caregivers and colleagues.

CO5: Knowledge of medical ethics and etiquette.

CLINICAL EXPERIENCE

Candidates for admission to the first year of the Postgraduate Higher Specialty Degree Course in D.M.GASTROENTEROLOGY shall be required to possess the following qualifications:

(a) He / She must have qualified for the M.D.(Medicine or M.D.(Pediatrics) of this University or any other University recognized as equivalent thereto by this authority of this University and the Medical Council of India.
(b) The admitting authorities of the university will strictly ensure that every candidate admitted to the Postgraduate Higher Specialty Degree Course in D.M. GASTROENTEROLOGY has obtained permanent registration certificate from any one of the State Medical Councils.

He / She must not be registered for any other post graduation course

THESIS:

MAINTENANCE OF LOG BOOK

1. Every Postgraduate candidate shall maintain a record of skills he has acquired during the three years training period certified by the Head of the Department under whom he has undergone training.

2. The Postgraduate candidates should also be required to participate in the teaching program.

3. In addition, the Head of the Department shall involve their Postgraduate candidates in Seminar, Journal Club and Group Discussions and assure their participation in Clinical, Clinico-Pathological conferences.

4. Every Postgraduate candidate should be encouraged to present short title papers in conferences and to make improvements in it and submit them for publication in reputed medical journals. Motivation by the Head of Departments is essential in this area to sharpen the research skills of the postgraduate candidates.

5. The Head of the Department shall scrutinize the Log Book once in every three months.

6. At the end of the course, the candidate should summarize the contents and get the Log Book certified by the Head of the Department.

7. The Log Book should be submitted at the time of clinical examination for scrutiny of the Board of Examiners.
DISSEPTION

1. All candidates registered to undergo Postgraduate Higher Specialty Degree Course in D.M.Medical Gastroenterology shall be assigned a topic for Dissertation / Thesis within 4 months of his / her admission to the course and title of the topics assigned to the candidates be intimated to the Controller of Examinations of this University.

2. The candidate shall have the opinion in lieu of Dissertation / Thesis to submit a monograph on any topic pertaining to his / her specialty. The Head of Department shall assign topic of the monograph to the candidates.

3. The Dissertation /Thesis shall be in a bound volume of minimum of 50 pages and not exceeding 75 pages of typed matter (Double line spacing and on one side only) excluding certification, acknowledgements, annexure and Bibliography.

4. Four copies of Dissertation shall be submitted four months prior to the commencement of the University Examinations on the prescribed date to the Controller of Examinations of this University.

EVALUATION OF DISSERTATION

1. The Dissertation shall be evaluated by three examiners (one internal and two external) prior to the commencement of the University theory examination.

2. Two copies of statement of result (accepted / not accepted) for dissertation shall be sent by the Examiners to the Controller of Examinations of this Deemed University. The Controller of Examinations shall forward a copy of the statement of result to the Chairman of the Board of Examiners who will consolidate the result at the time of clinical examinations.

3. If the Examiners suggest minor corrections and resubmission of dissertation, the candidate shall be informed by the Controller of Examinations of this Deemed University regarding the corrections that the candidate has to carry-out and the dissertation shall be revalued preferably by the same examiners and on receipt of their approval, the dissertation of the candidate shall be declared to have been ‘accepted’.
4. If the candidate fails in the written/clinical examination but his dissertation is approved, the results awarded for the Dissertation shall be carried over for the subsequent examinations.

5. If the Dissertation is ‘not accepted’ by two/all the Examiners, the candidate shall not be permitted to appear for the written/clinical examinations. The candidate shall resubmit a fresh dissertation four months prior to the commencement of the subsequent session of theory examinations and shall be eligible to appear for the examination only on approval of the dissertation.

METHODS OF TRAINNING:

DURATION OF THE COURSE

(a) The period of certified study and training for the Postgraduate Higher Specialty Degree Course in D.M. Medical Gastroenterology should there be three academic years.

(b) No exemption shall be given from the period of study and training.

COMMENCEMENT OF THE COURSE

The academic year for Postgraduate Higher Specialty Degree Course in D.M. Medical Gastroenterology shall commence during the first week of April of every year.

COMMENCEMENT OF EXAMINATIONS

There shall be two University Examination sessions in an academic year April and November/December.

WORKING DAYS IN AN ACADEMIC YEAR

Each academic year shall consist of not less than 300 working years.

ATTENDANCE REQUIREMENT FOR ADMISSION TO EXAMINATION
No candidate shall be permitted to appear for the University Examination unless he / she puts in 80% attendance during his / her period of study and training and produces the necessary certificate of study, attendance and progress from the Dean of the college.

**CONDONATION OF ATTENDANCE**

There shall be no condonation of attendance for Postgraduate students.

**TRAINING PROGRAMME IN GASTROENTEROLOGY**

He/She will be directly involved in day-day care of all patients in the OPD’s and patients admitted in wards under gastroenterology department. After initial evaluation he/she has to consult the respective consultant for further treatment plan.

He/She will have to do emergency duties as specified by the HOD.

He/She will have to be actively involved in the daily academic schedule as specified by the HOD. He/She should take part in the Seminars (Tuesday) and Journal club (Wednesday) in the first year. Second and third year students should take part in case discussion once a week (Thursday) and also participate in combined GI Meet (Monday)

All of them should actively participate in the Radiology and Pathology meet held as per schedule.

**F. SKILLS:**

Minimum procedures to be performed at the end of third year are as follows.

1. Diagnostic OGD 200
2. Diagnostic colonoscopies 50
3. Diagnostic sigmoidoscopies 100
4. Therapeutic OGD 50
5. Therapeutic colonoscopies 25
6. Liver biopsies 25
7. Assisting in ERCP, Sphincterotomy, Dilatation & other therapeutic procedures 25
Logbook will be meticulously maintained.

**TRAINING IN OUTSIDE CENTRES**

The Head of the Postgraduate Department shall make necessary arrangements for their Postgraduate candidates to undergo training in various skills in other centers, if such facilities are not available in the institution or hospital.

**G.SCHEME OF EXAMINATION**

(AT THE END OF THIRD YEAR)

<table>
<thead>
<tr>
<th>PAPER</th>
<th>PATTERN</th>
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<th>PASSING MINIMUM</th>
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<tr>
<td>Paper I Basic Sciences</td>
<td>10 Essays (10 marks each)</td>
<td>100</td>
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<tr>
<td>Paper II Clinical Gastroenterology</td>
<td>10 Essays (10 marks each)</td>
<td>100</td>
<td>400 200</td>
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<tr>
<td>Paper III Clinical Hepatology</td>
<td>10 Essays (10 marks each)</td>
<td>100</td>
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</tr>
<tr>
<td>Paper IV Recent advances</td>
<td>10 Essays (10 marks each)</td>
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<tr>
<td>Clinical</td>
<td>1 long case of 150marks 2 short cases of 75 marks</td>
<td>300</td>
<td>300 150</td>
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<tr>
<td>Oral</td>
<td>Spotters</td>
<td>100</td>
<td>200 100</td>
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<tr>
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<td>Viva Voce</td>
<td>100</td>
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Aggregate passing minimum 500/100
Minimum passing: The candidate should score at least 50 marks in each of the theory papers. Minimum passing for the practical examination should be 50 % i.e. 250 marks out of 500.

In case of failure the candidate should appear for both theory and practical examination next time.

MIGRATION / TRANSFER OF CANDIDATES

1. Migration / Transfer of candidates from any recognized Medical College to this University shall not be granted unless a “NO OBJECTION CERTIFICATE” is obtained for the Medical Council of India.

2. The provision of combination of attendance shall be granted to a transferee for admission to the examinations of this University on satisfactory fulfillment of the regulations of this University.

RE-ADMISSION OF AFTER BREAK OF STUDY

1. Candidates having a break of study of five years and above from the date of admission and more than two spells of break will not be considered for re-admission.

2. The five years period of break of study shall be calculated from the date of first admission of the candidate to the course inclusive of all the subsequent spells of break of studies.

3. A candidate having a break of study shall be re-admitted after satisfactory fulfillment of the regulations of the University at the commencement of an academic year only and shall undergo the full duration of the course. No exemption for the period of study already undergone or for the
examinations already passed shall be granted. He / She will be required to
appear for all the examinations as prescribed in the regulations.

**RECOMMENDED BOOKS:**

**Suggested text book reading**

1. Sleisenger & Fordtran’s Gastrointestinal and Liver Disease
   (Pathophysiology / Diagnosis / Management) – Mark Feldman, Bruce
   F. Scharschmidt, Marvin H. Sleisenger
   Laine, Chung Owyang, Don W. Powell
3. BERK – Bockus Text Book of Gastroenterology (Eight Volumes)
4. Sheila Sherlock – Diseases of Liver and Biliary System
5. Sciff-Text Book of Liver Diseases
6. Oxford Text Book of Liver Diseases
7. Text Book of Endoscopy – Peter Corton
8. Atlas of Endoscopy
9. Gastro Intestinal Pathology – Morson
10. Gastro Intestinal Radiology

**LIST OF JOURNALS:**

**Suggested journal reading**

1. Gastroenterology
2. GUT
3. Gastroenterology Clinics of N. America
4. Journal of Hepatology
5. European Journal of Gastroenterology and Hepatology
6. Indian Journal of Gastroenterology
7. Scandinavian Journal of Gastroenterology
8. Tropical Gastroenterology
9. American Journal of Gastroenterology