Maharashtra University of Health Sciences,

Nashik

Syllabus

“Fellowship Course in Pediatric Gastroenterology, Hepatology and Nutrition”

Title course: - Fellowship course in "Pediatric Gastroenterology, Hepatology and Nutrition"

Eligibility: - MD (Pediatrics)/ DNB (Pediatrics) from MUHS or any MCI approved College.

Selection: Merit & interview

Duration: 12 months Full Time course

Fees: As prescribed by the University from time to time.

Examination: At end of 12 months Clinical Posting (Post internship).

Marks: Passing Min 50% in each category

Attendance: For Regular class, Min 75% & for Practical (Internship) min 90%

Medium of Instruction: English.

Working knowledge of the local languages spoken is desirable.

INTRODUCTION :

Pediatric gastroenterology developed rapidly in the late 1960s , & in the mid-1970s, with the development of pediatric nutrition, and in 1990s it reflected the growth in hepatology. In 1996,United European Gastroenterology Federation (UEGF),conducted the first postgraduate course in pediatric gastroenterology and hepatology.

Pediatric gastroenterology, hepatology, and nutrition must be recognized as a pediatric subspecialty. As the predominant body for pediatric gastroenterology, hepatology, and nutrition in Europe, ESPGHAN has set standards in training.

The aims of this training syllabus are

1) to harmonize training in pediatric gastroenterology, hepatology, and nutrition

2) to establish clearly defined standards of knowledge and skill.

3) to foster the development of a network of competent tertiary care centers in pediatric gastroenterology, hepatology, and nutrition;

4) to further enhance Indian contribution to international scientific progress in pediatric gastroenterology, hepatology, and nutrition.

AIMS OF TRAINING

During the period of training the trainee should have received:

a) broad range of clinical experience in gastrointestinal and hepatologic diseases of children, together with their associated nutritional problems;
b) broad experience with the nutritional disorders of children;
c) specific training in diagnostic techniques and their interpretation;
d) experience in basic or clinical research;
e) contact with adult gastroenterology/hepatology;
f) knowledge of the administrative and organizational aspects of care for chronic pediatric gastroenterology and hepatology diseases;
g) experience functioning as part of a multidisciplinary team that includes addressing psychosocial aspects of various G.I.Diseases.

TEACHING

A logbook will be maintained and staged evaluation will be documented.

a) Clinical Teaching

a) In service training through supervised outpatients and in-patients care.
b) Clinical features, clinical data analysis, investigative work-up, clinical decision making, emergency care and ethical aspects of all common diseases in the field of gastroenterology and hepatology.
c) Clinical case presentations by trainees and ward rounds with faculty.

b) Procedures on patients

Several diagnostic and therapeutic procedures are done in the speciality of gastroenterology. Most prominent of them being endoscopic procedures. They have to be taught to the trainees in a graded and staged manner under close supervision. Desirable minimum numbers of the endoscopic procedures to be done by the trainees are listed below.

Procedures No.

a) Upper GI Endoscopy 100
b) Endoscopic variceal ligation/sclerotherapy 25
c) Proctosigmoidoscopy (rigid) 25
d) Pile banding 10
e) Flexible sigmoidosocpy 15
f) Full length colonoscopy 10
g) Polypectomy 5

c) Imaging and laboratory

Relevant diagnostic techniques in radiology and other imaging , laboratory investigations must receive attention. The theory behind these techniques will be discussed.

d) Didactic and theoretical teaching

It will be organized in semesters through seminars and journal clubs & will cover all common gastroenterological diseases and those that gain importance through recent research and information in pathogenesis, diagnosis and therapy.

e) Basic sciences

Trainees will be taught basic science aspects of techniques and diseases that they encounter such as molecular biology, biochemistry, physics, etc.

APPENDIX 1

Recommended Core Topics

- **Basic Sciences**

  1. Immune system of the gastrointestinal tract (GIT) and its importance in various GI disorders
  2. Molecular biology in relation to GIT
  3. Genetic diseases of the GIT and the liver
  4. Gene therapy
  5. GI tumors and tumor biology
  6. Gastrointestinal hormones in health and diseases
  7. Embryology of the gut, liver, pancreas and congenital anomalies.
  8. Physiology of the gastrointestinal tract including liver and pancreas

- **Esophagus**

  1. Basic anatomy, histology and physiology
  2. Congenital anomalies
  3. Motility of the esophagus and motor disorders
  4. Mechanism of deglutition and dysphasia
  5. Approach to a patient with dysphasia

6. Gastro-esophageal reflux disease
7. Tumors of the esophagus
8. Esophageal webs, membranes and diverticulum
9. Management of benign and malignant esophageal strictures
10. Esophagus and systemic diseases
11. Infectious diseases of the esophagus
12. Foreign bodies in the esophagus and stomach
13. Esophageal perforation
14. Drug induced esophagitis

- **Stomach**

1. Anatomy, histology, functions
2. Physiology of acid and bicarbonate secretion in health and diseases
3. Defence mechanisms against acid and pepsin
4. Gastroduodenal motor function in health and diseases.
5. Gastritis (nonspecific and specific)
6. Helicobacter pylori infection
7. Peptic ulcer
8. Dyspepsia
9. Stress and stomach
10. Gastric hypersecretory states including Zollinger Ellison syndrome
11. Ulcer complications and their management
12. Bezoars
13. Diverticuli and hernia of the stomach

- **Small Intestine**

1. Anatomy, blood supply, histology
2. Motility of the small intestine
3. Congenital anomalies
4. Normal absorption of the nutrients
5. Intestinal electrolyte absorption and secretion
6. Malabsorption syndromes Pathophysiology, manifestations and approach
7. Celiac sprue
8. Infection related diseases

a. Intestinal microflora in health and diseases
b. Tropical sprue
c. Whipple's disease
d. Infectious diarrhoea and food poisoning
e. Parasitic diseases

9. Small intestinal ulcers
10. Short bowel syndrome and intestinal transplantation.
11. Eosinophilic gastroenteritis
12. Food allergies
13. Intestinal obstruction and pseudo-obstruction
14. Short bowel syndrome
15. Acute appendicitis
16. Mal-rotation of the gut

17. Bezoars
18. Management of diarrhea acute as well as chronic.
19. GI lymphomas
20. Small intestinal tumors
21. Small intestinal transplantation

- **Colon**

1. Basic anatomy blood supply, histology and functions
2. Motility of the colon and disorders of motility
3. Congenital anomalies
4. Megacolon
5. Constipation
6. Colonic pseudo-obstruction
7. Fecal incontinence
8. Antibiotic associated diarrhoea
9. Inflammatory bowel disease
a. Ulcerative colitis
b. Crohn's disease
c. Indeterminate colitis
d. Ileostomies and its management
10. Diverticular disease of the colon
11. Radiation entero-colitis
12. Colonic polyps and polyposis syndromes
14. Other inflammatory diseases of colon including a. Solitary rectal ulcer syndrome b. Diversion colitis c. Collagenous and microscopic colitis d. Non specific ulcerations of the colon
15. Hemorrhoids
16. Diseases of the anorectum

Pancreas

1. Anatomy, physiology, blood supply, developmental anomalies
2. Physiology of the pancreatic secretion
3. Pancreatic function tests
4. Acute pancreatitis
5. Recurrent acute pancreatitis
6. Chronic pancreatitis
7. Cystic fibrosis and other childhood disorders of the pancreas
8. Hereditary pancreatitis.

- **Biliary Tree**

1. Anatomy, Physiology
2. Physiology of bile formation and excretion
3. Enterohepatic circulation
4. Bilirubin metabolism.
5. Approach to a patients with jaundice
6. Gallstones, its complications, and management

7. Acute acalculous cholecystitis
8. Miscellaneous disorders of the gallbladder
9. Acute cholangitis
10. Benign biliary structure
11. Benign and malignant neoplasms of the biliary system.
12. Congenital diseases of the biliary systems

- **Liver**

1. Anatomy, physiology, blood supply
2. Functions of the liver
3. Microcirculation of liver
4. Liver function tests
5. Portal hypertension : i. Extrahepatic portosplenic vein obstruction
   ii. Non cirrhotic portal fibrosis
   iii. Cirrhosis

6. Acute viral hepatitis
7. Chronic hepatitis
8. Fulminant hepatic failure
9. Subacute hepatic failure
10. Cirrhosis of liver
11. Ascites
12. Hepatorenal syndrome
13. Autoimmune liver disease
14. Metabolic liver disease
15. Sclerosing cholangitis- primary and secondary
16. Primary biliary cirrhosis
17. Hepatic venous outflow tract obstruction
18. Wilson's disease
19. Hemochromatosis
20. Liver in porphyria
21. Hepatic tumors
22. Infections of the liver
23. Liver in congestive heart failure
24. Liver biopsy
25. Liver transplantation and artificial liver support
26. Neonatal Hepatitis and Biliary Atresia

- **Peritoneum and Retroperitoneum**

1. Ascites
2. Chronic peritonitis
3. Budd-Chiari syndrome
4. Diseases of the retroperitoneum

- **Nutrition**

1. Normal nutritional requirements
2. Assessment of nutritional status
3. Protein energy malnutrition
4. Manifestations and management of nutritional deficiency and excess
5. Nutritional support in various GI disorders (mal-absorption, acute and chronic pancreatitis,
inflammatory bowel disease),IEM, Wilson's disease.
6. Nutrition in special conditions like Obesity, Sports.
7. Neonatal Nutrition issues
8. TPN/PPN.

- **Miscellaneous**

1. Upper and lower gastro-intestinal bleeding
2. Gastrointestinal tuberculosis
3. HIV and the GIT, hepatobiliary and pancreatic systems
4. GIT and liver in systemic diseases
5. Cutaneous manifestations of GI diseases
6. Vascular diseases of the GIT
7. Gastrointestinal side effects of drugs especially NSAIDs
8. Gastro-intestinal symptoms physiology and interpretation
9.Nausea, vomiting
10.Pain abdomen
11.Diarrhea
12.Constipation
13.Dysphagia
14.Jaundice

- **Vascular Diseases of the GI Tract**
- **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 and angiography and ERCP films

- **GI Pathology**

Reading and interpreting histological slides of common gastrointestinal and liver

Endoscopic Training

Endosocpic training is an integral part of training in superspecialty of gastroenterology. A trainee will work in collaboration with an adult G.I. department for the endoscopy.He will have knowledge of instruments and its application.
i. Endoscopes
ii. Accessories

iii. Sterilization of endoscopes and accessories
iv. Electrosurgical instrument
v. Keeping of endoscopes and accessories.

APPENDIX 2

Core objectives :The trainee will gain experience with and understanding of the following:

1) Epidemiology of the principal diseases encountered in pediatric gastroenterology and hepatology in childhood
2) Diagnostic and therapeutic procedures required for examination of the gastrointestinal tract and liver:
3) upper gastrointestinal endoscopy
4) colonoscopy
5) endoscopic procedures (e.g., polypectomy, removal of foreign bodies, sclerotherapy) endoscopic retrograde cholangiopancreatoscopy where appropriate
6) small intestinal and rectal biopsy
7) liver biopsy
8) motility studies (e.g., pH monitoring, transit studies, and a knowledge of manometry)
9) pancreatic function tests (e.g., screening tests, fecal elastase, and knowledge of intubation tests)

Nutritional skills that include knowledge of the following:

1)Assessing nutritional status

2) dietary requirements of children

3) pathophysiology of malnutrition

4) theory and techniques of enteral and parenteral nutritional support

5) role of nutrition support teams and special therapeutic diets

Skills will be in cooperation with other specialists (surgeons, pathologists, radiologists, laboratory scientists, adult specialists)

Syllabus

Training requirements for tertiary specialists include

1) basic knowledge;

Basic Pediatric topics in gastroenterology will include understanding of the following:

- The association of abnormal embryogenesis with clinical disorders (e.g., diaphragmatic hernia, malrotation, atresias, biliary atresia)
- Physiology of the gastrointestinal tract including liver and pancreas: e.g., causes of malabsorption, steatorrhea, and protein-losing enteropathy
- Fluid-balance disturbances and causes and treatment of dehydration
- Recognition and interpretation of common symptoms including failure to thrive in infancy, chronic diarrhea, recurrent abdominal pain, and vomiting
- Presentation, investigation, and treatment of major gastrointestinal disorders (e.g., celiac disease, gastroesophageal reflux, chronic inflammatory bowel disease, etc.)
- Basic knowledge of mucosal immunology
- Causes and management of acute gastroenteritis: which children need admission?

Basic knowledge of hepatology will include understanding of the presentation, investigation, and treatment of the following:

- Neonatal liver disease
- Acute liver disorders and infections
- Chronic liver disease
- Liver failure
- Mechanisms of disease and disorders leading to cholestasis
- Role of nutritional support particular to liver disease
- Metabolic liver disorders
- Indications for liver transplantation

Basic knowledge in nutrition will include understanding of the following:

- Basis of normal infant/childhood feeding
- Assessing feeding ability and nutritional status
- Recognition and management of feeding disorders, including anorexia nervosa and bulimia
- Mechanisms of malnutrition in gastrointestinal and liver disease
- Methods of nutritional support and their use
- Dietary requirements of children
- Short- and long-term effects of malnutrition in the infant, child, and adolescent

Basic investigative knowledge include understanding of the following:

- The basis for tests of malabsorption,
- liver dysfunction,
- breath tests,
- esophageal pH monitoring,

- manometric studies
- Indications and usefulness of relevant imaging and endoscopic techniques

Skills

Clinical skills will include the following:

- Assessing nutritional status of infants and children, including auxometry of height and weight
- Assessing dehydration, and planning fluid therapy
- Interpretation of plain radiographs and of contrast and other imaging studies
- Managing enteral and parenteral nutrition
- Prescribing elimination diets
- Knowledge of techniques for measuring dynamic nutritional parameters (e.g., resting energy expenditure)

Technical skills will include the following:

- Small intestinal biopsy
- Upper gastrointestinal endoscopy, diagnostic/therapeutic
- Colonoscopy
- Pancreatic function tests
- Esophageal pH and motility studies (e.g., transit studies and knowledge of manometry)
- Liver biopsies
- Sclerosis of esophageal varices and other vascular malformations
- Placement of endoscopic gastrostomy when appropriate
- Polypectomy
- Removal of foreign bodies

Management skills include the following:

- Conducting a clinical audit
- Managing admission policies, endoscopy lists, etc
- Understanding contracting and purchasing when appropriate
- Organizing a postgraduate teaching program

Research skills include the following:

- Designing clinical trials using medical statistics
- Organizing and presenting data
- Computer literacy including the ability to conduct a literature database search

The trainee will gain the ability to recognize and initiate diagnostic tests, and outline management of the following:

- Pyloric stenosis
- Intussusception
- Hirschsprung disease
- Peptic ulceration and *Helicobacter pylori* infection
- Vomiting
- Constipation
- Recurrent or protracted diarrhea
- Acute and recurrent abdominal pain
- Persistent jaundice in the young infant
- Intestinal bleeding
- Intestinal obstruction
- Differentiation of abdominal masses
- Acute liver failure
- Short gut syndrome
- Chronic inflammatory bowel disease
- Small intestinal failure and intractable diarrhea syndrome
- Infections of gastrointestinal tract and liver
- Gastroenterologic problems with acquired immune deficiency syndrome (AIDS)
- Gastrointestinal food allergy
- Acute diarrhea including use of oral rehydration therapy
- Outbreak of hospital-acquired diarrhea
- Chronic liver disease and metabolic liver disease
- Management before and after liver transplantation
- Intestinal motility problems
- Gastrointestinal problems in handicapped children
- Chronic undernutrition/failure to thrive
- Feeding disorders, including self-starvation
- Specific nutrient deficiencies iron, folate, vitamins (B_{12}, D, E, and K, thiamine, riboflavin, ascorbic acid), zinc, copper, selenium, and essential fatty acids

Syllabus for Paediatric Nutrition

Clinical nutrition is a major component and the following curriculum is devised.

A) Scientific Basis of Paediatric Nutrition

Genetics, biochemistry and physiology relevant to nutrition

Nutrition in fetal, infant and child development

Body composition and energy metabolism

Principles of growth and its regulation

Pathophysiology of malnutrition

Short and longterm consequences of over and undernutrition

B) Nutritional Requirements in Health and Disease

Energy requirements

Macronutrient requirements

Micronutrient requirements

C) Feeding & Nutrition of the Normal Child

Infant (milk feeding, particularly breastfeeding)

Toddler (complementary feeding)

Child (healthy diet)

Adolescent (healthy diet)

D) Recognition of Nutritional Problems and Nutritional Assessment

Anthropometry

Dietary assessment

Clinical assessment

Biochemical assessment

Metabolic methods of assessment

E) Principles and Practice of Nutritional Support

Changes in diet and special diets

Enteral and parenteral nutrition formulas

Delivery systems and routes

Monitoring, assessment and complications

F) Investigation & Management of Nutritional Problems Related to

Gastrointestinal disease

Intestinal failure

Hepatobiliary disease

Protein-energy malnutrition

Neurodisability

Cystic fibrosis

Critical and intensive care

Childhood cancer and immunodeficiency

Renal disease

Bone disease

Cardiac disease

Food intolerance and allergy

Specific nutrient deficiencies

Overweight and obesity

Anorexia nervosa

Failure to thrive and eating disorders

Neonatal problems

Surgical GI problems, especially short gut syndrome

Inborn errors of metabolism

TRAINING PROGRAM

Structure of the Program : Will be in the form of the modules. 10 in No.

3 – Gastroenterology

3- Hepatology

3- Nutrition

1 – Neonatal Nutrition

Facilities and Infrastructure Available :

A) Nutrition support team :

10 beded Nutrition Rehabilitation and Research Centre is present at Urban Health centre of LTMGH . Consist of

Resident Doctor, Dietician, Clinical Nutritionist and a Pediatrician.

B) Interdisciplinary working

paediatric surgery : For surgical Gastroenterology

Adult Gastroenterology : For endoscopy and procedures.

Community and Child Public Health Nutrition : For Nutritional Survey and analysis.

SUGGESTED READING :

1) Textbook of Pediatric Gastroenterology and Nutrition by Stefano Guandalini. 2010 edition
2) Essential **Pediatric Gastroenterology**, Hepatology, and **Nutrition** Stefano Guandalini.
3) Pediatric Gastroenterology in India Riyaz Arkal
4) Handbook on pediatric Nutrition American Academy of Pediatrics
5) Nutrition and Child development KE Elizabeth
6) Pediatric Endoscopy Harlan Winter
7) Atlas on pediatric endoscopy Wiley
8) Pediatric TPN Keith Kanarek