

GHANA COLLEGE OF PHYSICIANS AND SURGEONS

GASTROENTEROLOGY SUB-SPECIALTY CORE CURRICULUM

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1.0 INTRODUCTION

Gastroenterology has undergone rapid expansion in the past 2 or 3 decades as a result of scientific and technical advances such as fiberoptic endoscopy, endoscopic retrograde cholangio-pancreatography (ERCP), ultrasonography, CAT scan, MRI, discovery of *Helicobacter pylori* etc. Many complex and intricate diagnostic and therapeutic procedures are now routinely performed in high resource settings. Training in gastroenterology has therefore become more extensive and demanding. For this reason this exposure must be long enough for trainees to understand the natural history of disease and the impact of treatment both on the disease and on the patient. However instructors in procedures must impart a thoughtful, cost-conscious approach to the use of technology as an extension of the subspecialist's craft rather than as an end in itself.

Definition of a Gastroenterologist:

A gastroenterologist is a physician who is trained and certified as a specialist to manage, train others and carry out research in diseases of the gastro-intestinal tract and the hepato-pancreato-biliary system. At the end of the training, the trainee would have acquired adequate knowledge, skills and attitude including ethics and values of professionalism such that he/she will be able to clinically diagnose, investigate and treat patients with gastrointestinal and related diseases. Since Internal Medicine Specialists in West Africa will need to have broad expertise in General Internal Medicine, the goal is to train specialists who are able to approach complex problems in Internal Medicine and serve as an advisor for those seeking guidance on problems within the Subspecialties of Medicine.

2.0 OVERVIEW OF TRAINING IN GASTROENTEROLOGY

AIM: The aim is to produce a Physician who is competent to be appointed a Consultant Gastroenterologist.

OBJECTIVES: To produce a Gastroenterologist with the adequate knowledge, skills and attitude to be able to:

1. manage diverse gastroenterological diseases
2. engage in research in gastroenterology
3. teach and train in gastroenterology at undergraduate and postgraduate levels

Training must take place in institutions accredited for training in Internal Medicine and Gastroenterology and must conform to the following requirements of both The Ghana College of Physicians and The West African College of Physicians.

ENTRY REQUIREMENTS

A pass at the Part I examination (Membership) of the Faculty of Internal Medicine of the West African College of Physicians, Part II (Membership) of the Ghana College of Physicians and Surgeons, or their equivalent as recognized by the Ghana College of Physicians and Surgeons.

Gastroenterology training programs must provide an intellectual environment for acquiring the knowledge, skills, clinical judgment, attitudes, and values of professionalism that are essential to the practice of gastroenterology. They must be able to produce competent trainees.

3.0 DURATION OF TRAINING

This should be at least 3 years (36 months) after entering the gastroenterology programme. This must include a minimum of 18 months of clinic training experience. The emphasis should be on experience – the more experience gained under supervision the more skilled will be the specialist. With time the trainee should develop independence and be able to confidently function as a gastroenterologist with minimal supervision. A 3-year programme will allow adequate time for gradual reduction in the level of supervision. At the end of this period the trainee will have confidence to manage a variety of gastroenterological problems including complicated ones. Further training in the post-fellowship period should be encouraged but will not be mandatory.

Training Through Conferences and Other Non-patient Care Activities

In addition to the patient care experience, trainees should have extensive involvement in other types of experiences.

- a. Trainees should read current textbooks and monographs, relevant scientific literature, and distributed syllabus materials.
- b. Trainees should be encouraged to attend seminars, postgraduate courses, and annual scientific meetings of the major digestive diseases societies.
- c. Trainees should hold weekly clinical conferences, and attend basic science, journal club, and research conferences regularly, at least monthly. The journal club should be used as a tool to teach the skills of critical reading, detection of biases, assessment of validity of controls, application of statistics, generalizability of results, and related attributes of scientific studies.
- d. Interdisciplinary conferences with radiology, pathology, and surgery services should be held at least monthly.
- e. There should be regular tutorials/discussion to cover a core curriculum of physiology, pathophysiology, and clinical pharmacology.
- f. Visiting academic physicians should participate to stimulate new thoughts and ideas among trainees as well as faculty.
- g. Participation in quality assurance and continuous quality improvement programs should be required.
- h. The opportunity to formally study the elements of study design, decision analysis, outcomes and effectiveness research, statistics, epidemiology, and other skills necessary to conduct and evaluate clinical investigation should be available to all trainees yearly.

4.0 ROTATION THROUGH OTHER SUB-SPECIALTIES:

By virtue of the fact that the specialist gastroenterologist may be the sole internist or clinician in a non-teaching or district hospital it is necessary to have sufficient knowledge in other sub-specialties. In the first 12 months, the candidate shall spend 6 weeks in each of the following sub-specialties, trainees will continue the training program in gastroenterology during this rotation. Trainees will be supervised by the specialist consultant of that sub-specialty and a log book to document specific objectives for each sub-specialty as outlined below. These objectives are aimed to be of relevance to gastrointestinal problems (or to interface with gastrointestinal problems).

1. Cardiology and Cardiovascular diseases:

Learning objectives for GI trainees: As a result of this rotation the trainee will be able to recognize and manage/treat the following:

- i. The GI and hepatic manifestations of valvular heart disease and congestive heart failure (CHF).
- ii. The GI and hepatic manifestations of vascular ischaemia (including mesenteric ischaemia and 'shock liver') and embolic diseases.
- iii. The impact of gastrointestinal bleeding and hypovolaemia on cardiac ischaemia and output especially in cardiomyopathy states.
- iv. The GI and hepatic complications of commonly used drugs and /or treatment modalities for cardiovascular diseases and vice versa.
- v. The cardiac complications of common tropical hepatic and GI infections and their management (e.g. hepatic amoebiasis).

The trainee should complete two write-up cases for each of the above to be documented in the trainee's log book.

2. Rheumatology and Endocrinology:

Learning objectives for GI trainees: As a result of this rotation the trainee will be able to describe, recognize and manage the following:

- i. Common GI side effects of medications used in the treatment of arthropathies and non-infectious inflammatory disease.
- ii. GI manifestations and complications of diabetes mellitus.
- iii. Common GI manifestations of endocrinopathies.
- iv. Endocrine and rheumatological manifestations and complications associated with hepatic and inflammatory bowel disease.

The trainee should complete two write-up cases for each of the above to be documented in the trainee's log book.

3. Respiratory Medicine (Pulmonology)

Learning objectives for GI trainees: As a result of this rotation the trainee will be able to recognize, describe and manage the following:

- i. GI manifestations of tuberculosis (TB) and the GI side effects of anti-TB drugs.
- ii. Multi-organ failure and SIRS.
- iii. Respiratory manifestations of gastro-oesophageal reflux disease (GERD/GORD).
- iv. Hepato-pulmonary syndrome in chronic liver disease.

The trainee should complete two write-up cases for each of the above to be documented in the trainee's log book.

4. Dermatology and Infectious Diseases:

Learning objectives for GI trainees: As a result of this rotation the trainee will be able to describe, recognize and manage the following:

- i. Cutaneous manifestations of Inflammatory Bowel Disease and GI malignancy.
- ii. Cutaneous complications of medications for treatment of GI disorders.
- iii. GI and hepatic complications of common skin disorders e.g. exfoliative conditions, psoriasis, cutaneous lymphomas.

- iv. Retroviral infection (HIV/AIDs) and GI manifestations and hepatotoxicity of anti-retroviral agents.

The trainee should complete two write-up cases for each of the above to be documented in the trainee's log book.

5. Nephrology:

Learning objectives for GI trainees: As a result of this rotation the trainee will be able to describe, recognize and manage the following:

- i. Fluid management and resuscitation in patients with acute GI bleeding.
- ii. Hepato-renal syndrome.
- iii. Chronic Kidney Disease (CKD) and its GI complications.
- iv. GI manifestations of fluid and electrolyte imbalance.

The trainee should complete two write-up cases for each of the above to be documented in the trainee's log book.

6. Neurology

Learning objectives for GI trainees: As a result of this rotation the trainee will be able to describe, recognize and manage the following:

- i. Gastro-intestinal manifestations of common neurological disorders and their management
- ii. Hepatic encephalopathy and its management.
- iii. Gastrointestinal problems in a 'stroke' patient.

The trainee should complete two write-up cases for each of the above to be documented in the trainee's log book.

7. Radiology (including Ultrasound)

Learning objectives for GI trainees: As a result of this rotation the trainee will be able to describe, recognize and manage the following:

- i. Ultrasound guided liver biopsy
- ii. Drainage of amebic liver abscess
- iii. Evaluation and treatment of HCC with ethanol injection

The trainee should complete two write-up cases for each of the above to be documented in the trainee's log book.

8. Surgery

Learning objectives for GI trainees: As a result of this rotation the trainee will be able to describe, recognize and manage the following:

- i. Trauma
- ii. The acute abdomen
- iii. Surgical management of gastrointestinal diseases
- iv. Hepato-biliary-pancreatic surgery

The trainee should complete two write-up cases for each of the above to be documented in the trainee's log book.

In the second twelve months each candidate shall spend 4-6 weeks in each of the following units, in addition to the on-going core training programme in gastroenterology:

Surgery Departments - Gastrointestinal Surgery

Radiology Department - Gastrointestinal Radiology

Laboratory Medicine Department – Laboratory Medicine Relevant to Gastroenterology

Pathology Department – Gastrointestinal Pathology (including Immunology)

These learning objectives are achievable through rotations in both inpatient and outpatient medical services, electives in surgery, radiology and oncology. In addition, didactic lectures, regular participation in clinical and multidisciplinary conferences in Gastroenterology as well as periodic attendance to annual national meetings would help to meet these learning objectives. Since gastroenterologists will be expected to consult on gastrointestinal and liver diseases in neonates, infants and children, it is expected that training will include training in pediatric gastroenterology and hepatology.

Recommended reading materials:

Mayo Clinic Gastroenterology and Hepatology Board Review,
Gastroenterology and Hepatology MKSAP,
Textbook of Gastrointestinal Diseases by Sleisenger and Fordtran and Textbook of Clinical Gastroenterology by Howard Spiro.
Medical and Surgical Journals in Gastroenterology

5.0 LEVELS OF TRAINING

Level I: A minimum of 18 months of core clinical training will be necessary to acquire patient care experience, both out- and in-patient as well as specialized care experience. Basic (or core) training experience in hepatology is mandatory under the supervision of a hepatologist or gastroenterologist with expertise in liver disease management.

Competency training in basic endoscopy – upper and lower – is an essential requirement.

Trainees will develop research experience by producing a Dissertation based on any area of gastroenterology during the training period which will be submitted for evaluation at the end of training. The research proposal will have to be approved by the dissertation committee of the GCP or WACP (or an appropriate expert in that field of study, recognized by either College.)

Level II: Trainees will require further training in advanced procedures such as therapeutic endoscopy, ERCP, enteroscopy, capsule endoscopy where the necessary facilities are available. Trainees may elect to obtain further experience in centres outside Ghana during the 3rd year of training. (Trainees with a special interest in clinical laboratory investigation of the gastrointestinal tract, liver, or biliary tract, or advanced GI radiology may be assigned to the appropriate centre or department).

6.0 SPECIFIC PROGRAMME CONTENT:

i. Patient Care: Training experience in clinical care of both out- and in-patients is essential. In-patient care will include providing emergency care services. Each Resident must attend weekly gastroenterology clinic for both new and returning cases.

ii. Practical Procedures:

Endoscopy:

- a. Diagnostic upper GI endoscopy starting, in stages, with principles of sedation, intubation, then oesophago-gastro-duodenoscopy. Mucosal biopsies including obtaining appropriate endoscopic esophageal, gastric, and duodenal biopsies and duodenal fluid aspirates.
- b. Lower GI endoscopy - digital rectal examination, proctoscopy, flexible sigmoidoscopy, rigid sigmoidoscopy, and colonoscopy including colonic mucosal biopsy.
- c. Therapeutic endoscopy: Sclerotherapy and banding of oesophageal varices, Oesophageal stricture dilatation, Injection and coagulation of bleeding peptic ulcers, Polypectomy – colonic and gastric.
- d. Other endoscopic procedures, depending on availability of facilities: Endoscopic Retrograde Cholangio-Pancreatography (ERCP), Peritoneoscopy (Laparoscopy), Percutaneous endoscopic gastrostomy (PEG), Insertion of oesophageal and pyloric stents.

Non-endoscopic Procedures:

- a. Ascitic fluid paracentesis – diagnostic & therapeutic.
- b. Percutaneous or ultrasound guided liver biopsy.
- c. Drainage of amoebic liver abscess.
- d. Oesophageal manometry and pH studies.

6.1 SYSTEM SPECIFIC DISEASES OR TOPICS:

6.1.1. Clinical approach to the GI patient: History, examination and differential diagnosis

Learning Objectives:

- i. To understand the multiplicity of symptomatology of gastrointestinal and liver disorders and to adopt a holistic approach.
- ii. To appreciate the importance of developing empathy and rapport with the patient.
- iii. To recognize the emotional or psychological trauma the patient may be experiencing.

Introduction:

The GI patient may present with a wide variety of symptoms, some of which, on the surface, may not be directly related to the GI system e.g. skin lesions such as erythema nodosum or pyoderma gangrenosum or may be secondary to non-GI pathology e.g. constipation in hypothyroidism. In elucidating symptoms therefore the Resident must adopt a holistic and comprehensive approach.

A particular disease entity may present in different ways in any one individual or mode of presentation may vary on different occasions e.g. diarrhoea alternating with constipation. The presentation may be gradual and subtle and may take several months or even years; hence the need to regularly review symptoms for new clues if the initial diagnosis is not obvious eg a patient with gastric malignancy may present with non-specific features as anaemia until later.

Some gastrointestinal symptoms may be embarrassing to the patient e.g. excessive belching, flatulence, frequent noisy bowel movement, and the patient may be reluctant to mention them. It is important to establish good rapport and build mutual confidence at the outset so that the patient feels comfortable to provide a comprehensive history. In certain situations it may be necessary to ask “leading questions”. Information regarding other therapies – herbal, traditional, fetish priests, prayer camps, is important.

Patient confidentiality is important – to divulge patient information to a third party will require the patient's consent (verbal or written).

The physical examination should be conducted in a conducive atmosphere and privacy must be adequate. Exposure of the abdomen must be adequate without causing undue embarrassment – this is especially important when examination is taking place in an open ward, sometimes without adequate screens. Relevant but “sensitive” areas – groins, breasts may be exposed for examination and covered again. Digital rectal examination may have to be postponed until adequate privacy is assured. Tender areas must be examined gently – avoid “digging”.

There must be a frank discussion with the patient regarding possible diagnoses, using simple non-technical terms, and the need for further investigations. In situations where the diagnosis is not clear, this must be discussed. In our environment, cost implications of investigations are important and affordability must be considered. The most cost effective not necessarily most expensive, management plan must be adopted. High tech investigations are no substitute for careful clinical assessment.

Reviews (return visits) may be short or long depending on the clinical condition. Any changes or new development in the clinical state must be assessed and managed. Medical specialist consultations or referrals to allied services e.g. a dietician, must be appropriate.

At all times the patient must feel that the best possible care is being offered.

General Knowledge Areas:

- a. Embryology, functional anatomy and physiology of the gastrointestinal, hepatic and pancreatobiliary systems
- b. GI pathology
- c. GI Microbiology
- d. Fluid and electrolyte balance
- e. Drug absorption in health and disease
- f. Gut hormones, motility disorders, and cytokines
- g. GI pharmacology (drugs used in Gastroenterology and Hepatology)
- h. Investigation of gastrointestinal disorders
 - GI endoscopy (diagnostic & therapeutic)
 - Oesophago-gastro-duodenoscopy
 - Colonoscopy
 - Extended and deep enteroscopy
 - Endoscopic retrograde cholangiopancreatography (ERCP)
 - Oesophageal pH probe tests
 - Oesophageal motility studies
 - Liver biopsy
 - GI radiology
 - Plain X ray
 - Barium studies
 - Ultrasound, contrast ultrasound, and elastography
 - Abdominal CT scan
 - MR imaging – MRI, MRCP, MR elastography
 - CT and MR enterography
 - Angiography
 - Serum gastrin measurement and secretin testing
 - Schilling tests
 - Pancreatic secretory tests, fecal elastase
 - Skin fold and other metrics for assessment of nutritional status
 - Gastric emptying and intestinal and colonic transit studies
 - Anorectal angle and manometry testing, evacuation or defecatory proctogram

- Stool testing
 - Breath tests for diagnosing H.pylori, malabsorption and other disorders of digestion
 - Video capsule endoscopy
 - Cholescintigraphy or hepatobiliary iminodiacetic acid (HIDA) scan
 - Somatostatin receptor scintigraphy
 - Positron emission tomography (PET) scan
 - Laparoscopy
 - Histopathology, immunohistochemistry, cytology, fluorescence in situ hybridization (FISH)
- i. Nutrition
 - Assessment and management of under-nutrition
 - Prevalence and consequences of obesity
 - Nutritional support (enteral and parenteral)
 - Appropriate indications and formulations for nutritional support in the African setting
 - Refeeding syndrome
 - j. Women's health and the digestive system
 - k. Genetic defects in GI disease & the role of screening
 - l. Immunology and the GI tract
 - m. Basic surgical principles and the GI tract
 - n. Trauma to the GI tract and liver
 - o. The use of PCR and recombinant DNA testing in diagnosis of GI disease
 - p. Medical ethics in gastroenterology
 - q. Geriatric gastroenterology
 - r. Gastroenterology research

6.1.2. Disorders of the Oesophagus

Embryology, Anatomy and Physiology of the Oesophagus

Congenital disorders of the Oesophagus

Gastro-Oesophageal Reflux disease (GERD)

- Oesophagitis
- Stricture

Barrett's oesophagus

Oesophageal carcinoma

Caustic Oesophageal injury

Oesophageal infections

- Candidiasis
- HSV oesophagitis
- CMV oesophagitis

Dysphagia

Eosinophilic esophagitis

Esophageal motility disorders

- Achalasia
- Scleroderma
- Diffuse esophageal spasm

Esophageal dilatation

6.1.3. Disorders of the Stomach and Duodenum

Embryology, anatomy and physiology of the stomach and duodenum

Physiology of gastric acid secretion and its regulation by neuroendocrine, endocrine and paracrine factors

Non-ulcer dyspepsia/Non-cardiac chest pain

Chronic nausea

Diaphragmatic hernia

Peptic ulcer disease

- H. pylori
- H. pylori gastritis
- Gastric carcinogenesis
- Malt lymphomas
- NSAID-induced ulcers

Upper GI bleeding

- High risk criteria for UGI bleeding
- Oesophageal varices
- Severe reflux esophagitis
- Large hiatal hernia/Cameron erosions
- Hypertrophic gastric polyps
- Angiodysplasia
- Portal hypertensive gastropathy
- Gastric antral vascular ectasias (GAVE)
- Occult GI bleeding

Autoimmune gastritis

Pharmacology, efficacy and adverse effects including drug-drug interactions of drugs used in the treatment of disorders of the stomach and duodenum

- Prokinetic agents
- Histamine-2 receptor antagonists
- Proton pump inhibitors
- Mucosal protective agents
- Prostaglandin analogues
- Antibiotics.

Gastroduodenal neoplasms

- Gastric polyps
- Gastric adenocarcinoma
- Gastric lymphoma, including MALT lymphoma
- Neuroendocrine tumors of the stomach and duodenum, including carcinoid tumors
- Gastrointestinal stromal tumors
- Kaposi's sarcoma
- Ampullary polyps and carcinoma

Gastric volvulus

Gastric and duodenal rupture

Bezoars

Bariatric surgery

- Management of short and long term complications of gastric bypass surgery

Celiac disease

Whipple's disease

6.1.4. Disorders of the Small Bowel

Embryology, anatomy and physiology of the small bowel

Disorders of digestion and absorption

- Disaccharide enzyme deficiencies – sucrose-isomaltase, lactose intolerance
- Fat malabsorption
- Function and dietary sources of vitamins
- Clinical features of vitamin deficiencies
- Treatment of vitamin deficiencies
- Impaired bowel salt secretion in chronic cholestatic liver disease
- Small bowel bacterial overgrowth
- Celiac sprue
- Tropical sprue
- Common variable immunodeficiency (CVID)

Diarrhea

- Mechanisms of diarrhea
- Pathophysiologic classification of diarrhea

Acute Infectious diarrhea

- Causative organisms - rotavirus, Salmonella, Shigella, Vibrio cholera
- Epidemiology and mechanism of action
- Symptoms and management

Intestinal infestations

- Hookworm
- Ascaris
- Giardia

Opportunistic infections in immunosuppressed states

- Cryptosporidium
- CMV
- Giardia
- HIV enteritis

Abdominal tuberculosis

- Important clinical manifestations
- Diagnosis
- Therapy

Inflammatory bowel disease (IBD)

Crohn's disease

- Diagnosis – CT enterography, endoscopy, capsule studies
- Managing immunosuppression in the context of high population prevalence of TB
- Management in low resource settings
- Nutritional complications of IBD
- Metabolic bone disease
- Extraintestinal manifestations of IBD
- IBD in pregnancy
- Role of surgery in management of IBD
- Cancer risk in IBD – cancer surveillance,

Eosinophilic gastroenteropathy

Functional bowel disorders

- Definition of irritable bowel syndrome
- Diagnostic criteria (Rome criteria; alarm symptoms/features)
- Evaluation of patient with apparent IBS
- Differential diagnosis – lactose intolerance, celiac sprue, tropical sprue
- Management and follow up

Small intestinal neoplasms

- Regional incidence
- Small bowel adenocarcinoma
- Small bowel polyps in hereditary colorectal cancer syndromes
- Small bowel lymphoma
- Intestinal stromal tumors
- Intestinal Neuroendocrine tumors
 - Carcinoid tumors
 - Carcinoid syndrome
 - Biochemical markers - 5-HIAA, gastrin, chromogranin A
 - Distribution of gastrointestinal carcinoids

6.1.5. Disorders of the Large Bowel

Embryology, anatomy and physiology of the large bowel

Lower GI tract bleeding

Colonic infections and infestations

- Clostridium difficile
- Amebiasis
- CMV in the immunocompromised host

Inflammatory bowel disease of the large bowel

- Ulcerative colitis (UC)
- Crohn's Disease (CD)
- Malnutrition in IBD.
- Other nutritional complications of IBD
- Anorectal complications of IBD
- Extraintestinal manifestations of ulcerative colitis and Crohn's disease
 - Ocular
 - Dermatologic
 - Musculoskeletal
 - Hepatobiliary
 - Urinary tract
- Influence of IBD on pregnancy and pregnancy on IBD.
- Long-term cancer risk in ulcerative colitis and Crohn's disease.
- Colorectal cancer surveillance in IBD.
- Indications for surgery in ulcerative colitis and Crohn's disease.

Drug-induced colitis

Radiation-induced colitis

Ischemic colitis

Diverticulosis

- Diverticulitis
- Diverticular bleeding

Colorectal polyps

- Colonic polyps/polyposis syndromes
 - FAP
 - Hereditary nonpolyposis colorectal cancer (HNPCC/Lynch Syndrome)
 - MYH-associated polyposis
 - Hamartomatous polyposis syndromes – Peutz-Jeghers, Juvenile polyposis
 - Sessile serrated adenomas

Colorectal cancer

- High-risk groups for the development of colorectal cancer.
- Adenoma-carcinoma sequence in the pathogenesis of colorectal cancer
- Surveillance and screening for colorectal cancer
 - Recommended screening intervals
 - Stool testing
- Flexible sigmoidoscopy and colonoscopy
- CT colonography
- Surgical and medical therapy of colorectal cancer

6.1.6. Disorders of the Pancreas

Embryology, anatomy and physiology of the pancreas

Congenital disorders of the pancreas

- Pancreas divisum
- Annular pancreas

Acute pancreatitis

Pancreatic pseudocysts

Chronic pancreatitis

Solid pancreatic neoplasms

- Ductal adenocarcinoma of the pancreas
- Neuroendocrine tumors - insulinoma, vipoma, glucagonomas, somatostatinoma
- Acinar cell carcinoma of the pancreas
- Other solid pancreatic neoplasms

Cystic lesions of the pancreas

- Mucin-producing cystic neoplasms (MCN, IPMN)
- Serous cystic neoplasms

Pancreatic duct obstruction

Autoimmune pancreatitis

6.1.7. Disorders of the Biliary System

Embryology, anatomy and physiology of the biliary system

The entero-hepatic circulation of bile

- Consequences of ileal resection with bile salt induced diarrhea

Congenital disorders of the biliary tree

- Choledochal cysts
- Caroli's disease
- Biliary atresia
- Cystic disease of the liver

Neoplastic disorders of the biliary system

- Intrahepatic, hilar, and extrahepatic cholangiocarcinoma
- Gallbladder carcinoma
- Metastatic disease to the biliary tree or causing biliary obstruction
- Mucinous cystadenomas and adenocarcinomas

Inflammatory disorders of the biliary system

- Acute cholangitis
- Primary sclerosing cholangitis
- Secondary sclerosing cholangitis
- Immune associated cholangitis (IgG4-associated cholangitis)

Infections and infestations of the biliary system

- Ascariasis
- Liver fluke infestations – *Clonorchis sinensis*, *Opisthorchis viverrini*, *Fasciola hepatica*
- HIV associated cryptosporidiosis

Cholelithiasis and its complications

- Pathophysiology of biliary stones, cholesterol and pigment
- Biliary colic
- Acute cholecystitis
- Acalculous cholecystitis
- Gallstone pancreatitis
- Sickle cell related bile stone disease

Motility disorders of the biliary system

- Papillary or Sphincter of Oddi dysfunction
- Ampullary stenosis

6.1.8. Disorders of the Liver and Spleen

Embryology, anatomy, physiology and pathology of the liver and spleen.

Congenital disorders of the Liver

- Polycystic disease of the liver

Genetic liver diseases

- Haemochromatosis
- Wilson disease
- Alpha-1 antitrypsin deficiency
- Sickle cell hepatopathy

Drug metabolism and drug induced liver injury

- Herbal preparations
- Hepatotoxicity (including acetaminophen)
- Dose adjustment in patients with liver disease
- Drug-drug interactions and the liver.

Acute Liver Failure

Acute Hepatitis

- Non-viral acute hepatitis
 - Drug- and toxin-induced liver injury
- Viral Hepatitis

Chronic Hepatitis

- Non-viral chronic hepatitis
 - Autoimmune hepatitis
 - Alcoholic liver disease
 - Non-alcoholic fatty liver disease (NAFLD) or steatohepatitis (NASH)
 - Primary Biliary Cirrhosis
 - Drug- and toxin-induced liver injury

- Chronic viral hepatitis
 - Chronic hepatitis B
 - Chronic hepatitis C

Cirrhosis

Complications of cirrhosis and portal hypertension

- Esophageal and gastric varices
- Portal hypertensive gastropathy
- Ascites
- Spontaneous bacterial peritonitis
- Hepatic encephalopathy
- Hepato-renal syndrome

Budd-Chiari syndrome and other vascular disorders

The Liver in pregnancy

HIV and the liver

Hepatic parasites

- Schistosomiasis

Hepatic abscesses & cysts

- Pyogenic liver abscess
- Amebiasis
- Hydatid cyst

Hepatic mass lesions and neoplasms

- Hepatocellular carcinoma
- Hepatic adenoma and adenomatosis
- Hepatic hemangioma
- Focal nodular hyperplasia
- Simple hepatic cysts
- Cystadenoma
- Cystadenocarcinoma
- Epithelioid hemangioendothelioma
- Sarcoma/Angiosarcoma
- Lymphoma
- Peliosis hepatis
- Focal fat and focal fat sparing in the liver

Liver Transplantation

- Basic surgical principles
- Pretransplant evaluation
- Immunosuppression

Relevant splenic conditions

- Hyperreactive malarial splenomegaly (HMS, tropical splenomegaly)

7.0 EVALUATION OF TRAINEES:

Trainees will be expected to maintain a 'learning portfolio' that will track progress through the program and serve as evidence of competency. This will be in electronic format and will be reviewed regularly by the Program Director and training committee for formative and summative feedback. In addition to the content areas of the portfolio, attention will also be focused on writing, reflection, and self-improvement.

Sections include:

1. Case logs of the GI diseases encountered (from above) in checklist form
2. Case logs of procedures performed (as assistant vs independent completion) including:
 - a. Indications
 - b. Complications
 - c. Recommended follow-up
3. Schedule of learning activities for the month (in what settings and when with a brief description of how this applied to the overall learning plan)
4. Case logs of required disease sets to be encountered (e.g. from Section 4 above on Other Subspecialties)
5. Weekly documentation of at least one clinical problem that required extra reading or a 'literature search' with a statement on how this impacted care (1-2 pages).
6. Monthly presentations at GI conference (with a copy of the PowerPoint slide set or case synopsis)
7. Presentations at Journal Club
8. Copies of evaluations that the trainee has completed on their peers presenting at GI conference and Journal Club (to demonstrate their ability or provide meaningful feedback to improve education).
9. Evaluation forms from patients, nurses, peers, students/junior trainees, and supervising faculty from the clinical arena.
10. Evaluation forms from visiting faculty on case presentations and 'audits' with discussions of 3 and 4 above.
11. Required 'practice improvement' exercise each year whereby trainees analyze a pattern to their practice that they seek to improve.
12. Performance results on yearly 'in service' multiple-choice question exams. Trainees will also be required to write a brief report on how they plan to improve their performance based on the scores.
13. One proposed research idea, written in the form of a question with a proposed approach to arriving at an answer.
14. Evidence of outside conferences/meetings attended with a written report on what they've learned that will change their practice or shape their research.

A key expectation is for visiting faculty to sit down with each trainee, review their portfolio, and make recommendations for continued growth.

There will be formative and summative assessment of the trainee. The summative assessment shall be done only after he/she has been duly signed up by the supervising consultant as having satisfactorily undergone the training as specified by faculty. This will be done through assessment of the various completed log books namely, patient care record, endoscopy, subspecialty rotation. To ensure quality, the Program Director will engage with faculty, trainees and graduates to elicit feedback on the curriculum, faculty and whether instructional objectives are being met.

Format of Formative Evaluation:

- Portfolio writing of instructive cases to be reviewed by qualified faculty during each rotation: number will be set by faculty
- Assessment of Logbooks by faculty (i.e. number of endoscopies, liver biopsies performed by trainee to be certified for independent practice: minimum number required will be set by faculty)
- Clinical Competency Assessments following direct observation of trainee during work, ward rounds and practical procedures
- Structured Practical Assessments of trainees with stereotypical clinical cases and scenarios by qualified faculty:
 - History taking and examination
 - Communication skills and Medical Ethics
 - Patient Management
 - Practical procedures (endoscopy, liver biopsy, abdominal paracentesis)

Format of Summative Examination:

- Multiple Choice Questions (MCQ)
- Viva voce in General Internal Medicine
- Viva voce and Clinical Examination in Gastroenterology and Hepatology
- Defense of Sub-Specialty Dissertation

8.0 PROGRAMME FACULTY:

Program Leader / Director:

In our current setting Joint Program Directors- one Physician and one Surgical gastroenterologist – (Director and Co-Director) will be appropriate initially to facilitate the initiation and smooth operation of the Training Program. The Director and Co-Director must be Fellows of Ghana College of Physicians & Surgeons (GCPS) or Fellows of the West African College of Physicians & Surgeons (WACPS).

Faculty:

A minimum of one, preferably two, gastroenterologists will be required depending on the number of Trainee Residents. In addition Visiting Faculty members from overseas (USA, Europe, South Africa and the UK), may provide teaching and training at regular intervals to support local faculty. Overseas faculty will have Board Certification in their Home Country and may be invited by the Ghana College/Program Directors as Visiting Faculty in the Sub-Specialty program.

9.0 REQUIREMENTS FOR ACCREDITATION OF TRAINING INSTITUTIONS

Prior accreditation for Part I Residency Training Program
Gastroenterology Unit with the following:

- i. Minimum Staffing
 - a. Gastroenterologists preferably more than 1
 - b. Residents
 - c. Endoscopy Nurses
 - d. Technical and Secretarial Staff
- ii. Procedure Units
Procedure Room
 - a. Procedure bed (1)
 - b. I.V. ceiling tracts and hangers, curtain tracts/mobile screens
 - c. Patient monitor with pulse oximeter
 - d. Suction machine and oxygen supply
 - e. Video-monitors
 - f. X-ray viewing boxes
 - g. Hand washing sink
 - h. Emergency drugs and I.V. supplies

Adjacent Room

- a. Equipment and supplies
- b. Patient trolleys
- c. Cardiopulmonary resuscitation equipment and supplies
- d. Storage areas for endoscope cases, linen supplies
- e. Recovery area – with oxygen, Nurse call system, suction facilities
- f. Patient education room
- g. Toilet facilities
- h. Cleaning room – for endoscopes and accessories
- i. Soiled Utility room/section

CLINICAL PATHOLOGY LABORATORIES

Access to facilities and tests relevant to the GI tract, liver, pancreas and biliary system.

Liver blood tests, clotting, stool examination and culture, faecal pancreatic elastase, Helicobacter pylori stool antigen, viral hepatitis serologies, alpha fetoprotein, histopathological of specimens from GIT, serum tissue transglutaminase, immunoassays for autoimmune conditions, PCR analysis for GI pathogens.

RADIOLOGY DEPARTMENT

- a. Facilities for standard X-ray tests, barium and other contrast studies with fluoroscopy.
- b. Ultrasonography
- c. CAT Scan
- d. MRI
- e. Capsule endoscopy (optional)
- f. Interventional Radiology (optional)
- g. Angiography (optional)

LIBRARY

With standard textbooks on gastroenterology, hepatology, and endoscopy and GIH journals (both local and international) e.g. GUT, Gastroenterology, Clinics in Gastroenterology
Internet access for literature searches