

**“This prospectus is made under the provisions of the Universities Act, the Postgraduate Institute of Medicine Ordinance, and the General By-Laws No. 1 of 2016 and By-Laws No. 2 of 2016 for Degree of Doctor of Medicine(MD) and Board Certification as a Specialist”**

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**POSTGRADUATE INSTITUTE OF MEDICINE**

**UNIVERSITY OF COLOMBO, SRI LANKA**



**Prospectus**

**Board Certification**

**in**

**Gastrointestinal Surgery**

**2014**

Specialty Board in Gastrointestinal Surgery  
Board of Study in Surgery

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## **1. Introduction**

Gastrointestinal(GI) surgery as a specialty has evolved worldwide over a considerable period of time. The scope of GI surgery includes upper gastrointestinal surgery, Hepato-Pancreatico-Biliary (HPB) surgery and Coloproctology (Colorectal Surgery). Though all the trainees in GI surgery will be board certified as Gastrointestinal surgeons at the end of successful completion of the program, trainees are encouraged to select one of these as their area of special interest with a view to developing expertise in that field in future.

A GI surgeon is a specialized surgeon who has the capability of handling uncommon scenarios and performing difficult surgical procedures in there field of specialization. This is best accomplished by the surgeons who are frequently exposed to these complicated procedures. An attempt was made to cover the spectrum of GI surgery in the Curriculum that has been developed and included along with the prospectus. Therefore trainees in GI surgery are advised to follow the guidelines in this prospectus and use the curriculum to achieve the standard required for a specialized GI surgeon.

This prospectus has been prepared by the specialty board in GI surgery in the PGIM. It is expected to serve as a guide to trainees and trainers in GI surgery

## **2. Training Programme - Setting and organisation**

### **2.1. Entry Criteria:**

To enter the training program in Gastrointestinal Surgery the candidate should:

2.1.1 Complete the MD (Surgery) Part II examination conducted by the Postgraduate Institute of Medicine, Sri Lanka, and

2.1.2 Not be Board Certified by the PGIM in any specialty or sub-specialty

### **2.2 Selection process**

Trainees are selected based on order of merit in the MD (Surgery) examination and trainee's preference.

### **2.3 Trainee Posts**

The number to be enrolled will be notified in a circular issued by the PGIM. It will be decided upon by Board of Management of the PGIM on recommendation of the Specialty Board in GI Surgery and Board of Study in Surgery, in consultation with the Ministry of Health.

### **2.4 Training Centers**

Training in GI Surgery should be in a GI Surgical unit affiliated to a Teaching Hospital. The center should have facilities for in patients and out patients and have adequate facilities for Endoscopy ( Diagnostic and Therapeutic) and adequate operating time in a well equipped operating theater for conventional and advanced Laparoscopic surgical procedures. Training units are recognized for post MD training only after evaluation of an audit submitted by the unit in accordance with the regulations laid by the PGIM.

### **2.5 Faculty and Trainers**

Trainers must be board certified in the PGIM and must have completed five years of service after board certification. Members of the faculty must have adequate clinical experience and research interest. They should be committed to teaching and have enthusiasm to the training program.

## **2.6 Duration of training and rotation of training centers**

The total duration of in-service training shall be three (3) years, which may be completed in one of two ways.

### **Option 1**

Two years of training in Sri Lanka, in a surgical unit recognized for postgraduate training in gastrointestinal surgery by the Board of Study in Gastrointestinal Surgery.  
and

One year of training in an overseas surgical unit approved by the Board of Study in Surgery, on the recommendation of the Specialty Board in Gastrointestinal Surgery for training in gastrointestinal surgery

### **Option 2**

One year of training in a Sri Lanka in a surgical unit recognized for postgraduate training in gastrointestinal surgery by the Board of Study in Surgery  
and

Two years of training in an overseas surgical unit approved by the Board of Study in Surgery, on the recommendation of the Specialty Board in Gastrointestinal Surgery for training in gastrointestinal surgery.

## **2.7 Objectives**

On completion of the three year period of training, the trainee should:

- a) have skills appropriate to a specialist in GI Surgery (diagnostic, operative, counseling, risk management, management of medico-legal issues)
- b) have administrative and organizational skills
- c) be able to clearly document and prioritize problems
- d) have appropriate attitudes
- e) be able to cooperate with and assist other surgical sub-specialists as well as general surgeons
- f) be able to conduct and supervise research and clinical audits
- g) be committed to continuous professional development
- h) be able to disseminate knowledge effectively
- i) have an adequate knowledge of the English language and be able to communicate effectively in it
- j) have adequate knowledge and skills in information technology

## 2.8 Learning activities

During the training period, trainees are also expected to engage in the following:

- a. Attend radiology meetings (ideally on a weekly basis).
- b. Attend pathology meetings (ideally on a weekly basis)
- c. Take part in multi-disciplinary team discussions
- d. Participate in, (and conduct where necessary) regular audit/ morbidity & mortality meetings
- e. Engage in Continuing Medical Education activities (2.8.1)
- f. Undertake clinical studies and present at local, regional, national or international meetings. Trainees are also encouraged to carry out a research project (2.8.2)
- g. Engage in the teaching (2.8.3)

### 2.8.1 CME activities

The recommended CME activities include

- Participation at regional and international workshops Attend an international meeting preferably in the chosen area of special interest (eg. Association of Colorectal Surgeon of India, Malaysian Society of Colorectal Surgeons meeting, Asian Federation of Coloproctology meeting, Australian Colorectal Society meeting, European meeting, The Association of Coloproctology of Great Britain and Ireland, American society of Colorectal Surgeons etc)
- Participation at annual scientific meetings organized by the professional colleges and other societies
- Participation at seminars/lectures/scientific sessions organized by local societies
- Participation at guest lectures
- Organize / take part as a resource person/ participation at workshops
- Attend and present at the Journal Clubs
- Presentations at scientific conferences (Local/ regional, national or international)

### 2.8.2 Research & Publications

Clinical research is part of the training program. Trainees in GI surgery are required to carry out a research project and submit a dissertation on the work done three months prior to PCBA. The format can be found in annex - 2.

Or

Publish at least one paper in an indexed journal **and** make one oral presenting or two poster presentations in annual scientific sessions.

In addition trainees are advised to participate in training programs/workshops on Research Methodology & Scientific Writing conducted by the PGIM and other academic societies

### **2.8.3 Teaching**

Trainees are expected to engage in teaching and training of other medical professionals as part of their training. They are expected to acquire:

- Knowledge and skills to train Nurses, Undergraduates, residents and Post graduate students.
- Skills to organize and conduct Gastroenterology related public education programs

## **2.9 Documentation of training**

Trainees must document their training on an ongoing basis through out their training period by means of,

- a. Log book
- b. Portfolio

### **2.9.1 Log book**

A comprehensive log of operative and endoscopic procedures carried out during the period of training has to be maintained using the format given in Annex 3.

### **2.9.2 Portfolio**

#### **Introduction**

The portfolio serves as an important tool for the assessment of trainee's performance and learning processes. It will be used as an assessment criterion of the training program at regular intervals as well as at the pre-board certification assessment (PBCA). It is a key document in the **formative** assessment of the trainee during the training program.

The objective of maintaining the portfolio is,

- to assist the trainee to record his or her training in brief so that the experience acquired can be assessed and any deficiencies identified and remedied.
- to assist supervisors and assessors to evaluate the overall training and provide necessary guidance where required.

#### **Components**

1. Log of Procedures carried out
2. Work based assessment (at least one per month)
  - 2.1 Case based discussions (CbD)
  - 2.2 Direct Observation of Procedural Skills (DOPS)
3. Lectures/Teaching
4. CME activities
5. Research and Publications
6. Information Technology
7. Professional Development
8. Medico legal Issues
9. Summary of activities



## **Maintenance**

The portfolio should be maintained as a ring-bound document in separate sections to conform to the format given in Annex - 4. Entries in the Portfolio should be made by the trainee at the time of acquiring the skill and be endorsed by the trainer or supervisor. The trainee is expected to keep it updated regularly. It is the responsibility of the trainees, the trainers and the supervisors to ensure that the entries in the portfolio are authentic and made regularly. It is essential to provide the trainee with accurate feedback on his or her views about his or her performance during the training period.

## **2.10 Supervision of training**

### **2.10.1 In service assessment**

The trainer should review the trainees logbook and portfolio at the completion of six months and provides direction and advice and sets goals for the next six months

### **2.10.2 Peer Team Ratings (PTR)**

Trainees are also expected to submit 3 sets of Peer Team Ratings as per standard PGIM requirements.

### **2.10.3 Progress reports (During the period of training abroad)**

Trainers are required to send 6-monthly progress reports during the period of training abroad, to the Specialty Board in GI Surgery. Progress reports should be made as per the format shown in annex -5.

## **2.11 Assessment and Appraisal of Training (PBCA)**

In order to be eligible for the Pre Board Certification Assessment (PBCA), trainees should have completed 3 years of training. At the end of training trainees are eligible to apply for PBCA. The application should be made to the PGIM along with the following documents

- 2.11.1 The completed log book
- 2.11.2 The completed portfolio
- 2.11.3 Reports of satisfactory progress during the 3 year period of training
- 2.11.4 Completed PTR forms
- 2.11.5 Completed publication and presentations /the research project

### **2.11.1 Pre Board Certification Assessment**

The PBCA is the final, summative assessment of the trainee's portfolio. It will be carried out by two independent examiners appointed by the Board of Study in GI surgery on approval by the Senate of the University of Colombo. The one examiner will be from an other speciality.

The trainee will be called for one hour oral examination, during which he/she will be questioned on the portfolio by the two examiners (30 minutes with each examiner). The trainee may be required to start with a presentation of 10 – 15 minutes, on the post-MD training if the examiner/s feels it is appropriate.

The overall assessment will be based on each of the main sections, which will be assessed as satisfactory or not on an overall basis.

### **12.11.2 Repeat Assessment**

If the examiners are of the view that the trainee's performance is unsatisfactory, the trainee will not be given immediate Board Certification. The examiners will provide the trainee with a written feedback on how the portfolio should be improved in order to reach the required standard. The trainee should then re-submit the portfolio within a specified period of time (up to 3 – 6 months), and face another oral examination based on the re-submitted portfolio. If the trainee is successful at this 2<sup>nd</sup> oral examination, the date of Board Certification will be backdated as it is done routinely. In the event that the candidate was unsuccessful at the second attempt, the date of Board Certification will be the date of passing the subsequent PBCA following further training for a minimum period of six months in a unit selected by the Board of Study.

## **2.12 Board Certification in GI Surgery**

Trainees who have successfully completed the Pre Board Certification Assessment and successfully completed the research project are eligible for Board Certification as a Specialist in Gastro-intestinal Surgery, on the recommendation of the Specialty Board in Gastrointestinal Surgery and the Board of Study in Surgery.

## **Annex 1. Curriculum**

### **Esophagus**

#### **Core knowledge**

##### Anatomy

- Embryology of the foregut and relevance to congenital anomalies.
- Anatomy of the esophagus and its relationship with the adjacent structures.
- Arterial supply and venous drainage
- Lymphatic drainage and regional lymph nodes
- Histology of the esophagus

##### Physiology

- Deglutition
- Peristalsis
- Lower esophageal sphincter
- Esophageal pH & manometry

##### Pathology

- The pathophysiology of the benign disorders of the esophagus
- Etiology and pathogenesis of Esophageal malignancies
- Classification & staging of malignancies
- Spread of upper GI malignancies, prognosis and prognostic indicators
- Histopathology

#### **Clinical skills**

Presentation and natural history of benign disorders of the esophagus including

- Hiatus hernia, reflux disease & Barrett's esophagus
- Corrosive injury (early & late management)
- Perforation (Iatrogenic and Spontaneous)
- Blunt & penetrating trauma
- Foreign body ingestion
- Strictures
- Fistulae
- Motility disorders
- Neuromuscular disorders
- Rings & Webs
- Pharyngeal & esophageal diverticula

The investigative modalities available for accurate diagnosis

The available treatment options, and results, including risks and benefits of the operative and non-operative options

The pre, intra and postoperative management, including the complications of therapy.

Presentation and natural history of the benign and malignant tumors of the esophagus with special emphasis on squamous cell carcinoma and adenocarcinoma

The investigative modalities available for accurate diagnosis

The available treatment options, and results, including risks and benefits of the operative and non-operative / palliative options

The pre-, intra- and postoperative management, including the role of neoadjuvant and adjuvant therapy

### **Procedural skills**

Surgery for malignancy (Open/ Laparoscopy assisted/ Thoraco Laparoscopic)

McKeown (Combined abdomino-thoraco-cervical approach)

Orringer (Transhiatal)

Ivor Lewis (Combined laparotomy & right thoracotomy)

En bloc resection (2 field, 3 field lymph node resection)

Surgery for Hiatal hernia, gastroesophageal reflux

Fundoplication (open and laparoscopic)

Nissen

Belsey Mark IV

Hill repair

Dor repair

Toupet

Combined operations

Surgery for oesophageal strictures

Selection & placement of the conduits

Dilatation

Achalasia cardia

Heller cardiomyotomy

Esophageal replacement for end stage disease

Esophageal perforation

Resection

Closure

Diversion

Thoracic drainage

Esophageal diverticula (Indications for surgery, principles and operative technique)

## **Stomach**

### **Core knowledge**

Anatomy

Embryology of the stomach, greater and lesser omentum with a view to understanding the developmental abnormalities

Gross anatomy: normal anatomy and variants, relationship to major arterial and venous structures and adjacent organs

Arterial supply and venous drainage

Lymphatic drainage and regional lymph nodes

Histology

Physiology

Gastric acid secretion

Gastric motility

Gastric function tests

## Pathology

Classification, incidence & pathology of benign tumors of the stomach

Carcinoma of the stomach: incidence, etiology and pathogenesis, histological classification, molecular biology and patterns of spread

### Staging

H pylori – bacteriology & as a causative factor in peptic ulcer Gastric cancer aetiopathogenesis of acute gastritis & chronic atrophic gastritis

Gastric ulcer & complications

Pathophysiology of gastric outlet obstruction

Morbid obesity: etiological factors (diet & genetics), body image & social factors, associated metabolic abnormalities

## Clinical skills

### Objectives:

The pathophysiology, presentation and natural history of the benign disorders of the Stomach including

Gastric ulceration

Gastritis

Gastric outlet obstruction

Superior mesenteric artery syndrome

Gastric volvulus

Zollinger Ellison syndrome (Gastrinoma)

Menetrier's disease

Foreign bodies & Bezoars

The investigative procedures available for the diagnosis of these conditions

The treatment options available for these condition and the results, including the risks and benefits of the operative and non-operative procedures.

Pre, intra and postoperative management, including the place of Neoadjuvant/

The pathophysiology, presentation and natural history of the benign and malignant tumors of the Stomach with special emphasis on Carcinoma of the Stomach.

The investigative procedures available for the diagnosis and staging

The treatment options available for these condition and the results, including the risks and benefits of the operative and non-operative palliative procedures.

Pre, intra and postoperative management, including the place of Neoadjuvant/ adjuvant therapy

management of complications of therapy.

### Procedural skills

Surgery for Carcinoma of the Stomach (Open & Laparoscopic)

Gastric resection

Total resection

Partial resection (Distal & Proximal)

Combined resection (other organs)

Lymph node resection (R0, R1, R2)

Reconstructive procedures (Gastrojejunostomy Billroth I & II. Esophago gastrostomy with or without a pouch). Use of Staplers & hand anastomosis for reconstruction

Bypass procedures (Gastrojejunostomy)

Exploratory Laparotomy

Surgical procedures for Peptic Ulcers (Open & Laparoscopic approach)

Truncal vagotomy & Pyloroplasty

Other selective vagotomy procedures/ Antrectomy

Surgery for perforated Peptic Ulcer

Surgery for bleeding Peptic Ulcer

Surgery for Gastric outlet obstruction

Pyloroplasty

Gastric bypass

Gastric resection

Duodeno jejunosomy (Superior Mesenteric artery syndrome)

Surgery for morbid obesity and metabolic surgery (Open & Laparoscopic approaches)

Laparoscopic Gastric banding

Laparoscopic sleeve Gastrectomy

Gastric bypass

Duodenal switch

## **Upper Gastrointestinal bleeding**

### **Core knowledge**

Gross Anatomy (Regional)

Pathophysiology of hemorrhage and shock

Etiology / Pathology of acute Upper GI Bleeding

Variceal bleeding & portal gastropathy

Non variceal bleeding

Peptic Ulcer Disease

Malignant tumors

Mallory-Weiss tears

Stress gastritis

NSAID induced

Angiodysplasia

Oesophagitis

Aorto-enteric fistula

Occult Upper GI Bleeding

Bleeding from the Small bowel

Angiodysplasia

Meckel's diverticula

Tumours (GISTs, Lymphomas, Carcinoids)

Haemosuccus pancreaticus

Pathophysiology of acute & chronic blood loss, Portal Hypertension (see also Portal hypertension under Hepatobiliary surgery)

H pylori as an etiological factor

Diagnosis & eradication of H pylori

### **Clinical skills**

History & examination to elicit a probable diagnosis at presentation (Variceal vs non variceal bleeding/ Stigmata of chronic liver disease)

Resuscitation of a patient with massive upper GI bleeding.

ABC & fluid resuscitation

Intubation if obtunded

Place of nasogastric lavage

Use of Medical therapy in upper GI bleeding

Investigations

Massive UGI bleeding-Urgent UGI endoscopy / be familiar with the scoring systems

Occult UGI bleeding

Place of push enteroscopy/ double balloon enteroscopy and Capsule endoscopy

Application of, CT abdomen, Angiography, Nuclear medicine scans & their limitations

Treatment options available (Medical/ Endoscopic/ operative/ interventional and the selection of appropriate procedure

Surgical management including preoperative management, postoperative management

Management of complications

### **Procedural skills**

Endoscopy (see under Endoscopy)

Surgery (Open and laparoscopic)

Procedures for Duodenal ulcer

Suture ligation

Suture ligation, truncal vagotomy & pyloroplasty

Truncal vagotomy, antrectomy and resection of ulcer

Procedures for Gastric ulcer

Biopsy , oversew or excision of ulcer

Distal Gastrectomy

Left gastric artery ligation & over sewing for high lesser curve ulcers

Intraoperative endoscopy

## **Small Bowel, Appendix, Omentum & Peritonium**

### **Small bowel**

#### **Core knowledge**

##### **Anatomy**

Embryology of the Small bowel, Greater Omentum & Lesser Omentum with a view to understand the developmental abnormalities

Gross Anatomy. Relationship with major structures and adjacent organs

Arterial supply and venous drainage

Lymphatic drainage and regional lymph nodes

Histology

##### **Physiology**

Small bowel secretion & regulatory mechanisms

Motility of the small bowel & motility studies

Nutrition & Fluid balance

Physiological changes in prolonged TPN

## **Pathology**

Etiology & pathophysiological changes in acute intestinal obstruction

Etiology & pathophysiological changes in small bowel fistulae

Classification, Incidence & pathology of benign tumors of the small intestine

## **Clinical skills**

Presentation and natural history of disorders of the Small bowel including

Small bowel obstruction

Small bowel fistulae

Diverticular disease

Chron's disease

Neoplasms

Radiation Enteritis

Nutrition for Small bowel disorders

The investigations available to efficiently diagnose the disease including the biochemical tests & imaging

The treatment options(Medical, Endoscopic & Surgical) available for the conditions and the results,

Risks and benefits of the operative and non-operative procedures.

Pre, intra- and postoperative management

The place of Neoadjuvant/ Adjuvant therapy where applicable

Management of complications of therapy

## **Procedural skills**

Surgery

Explorative laparotomy for intestinal obstruction

Diagnostic Laparoscopy

Adhesionolysis

Small bowel resection & Anastamosis

Closure of Enterostomy

Perform additional procedures (ex Obstructed Hernia, Intussusception, resection of Polyp/ tumor

Excision of Meckl's diverticulum

Stricturoplasty

Creation of small bowel Stoma & subsequent care of the Stoma

Closure of small bowel Stoma

Surgery for recurrent intestinal obstruction

Gaining access for the TPN & care of the central lines

Endoscopy (See under Endoscopy)

## **Appendix**

### **Core knowledge**

Anatomy

Gross anatomy of the Appendix. Relationship with major structures and adjacent organs

Arterial supply and venous drainage

Lymphatic drainage and regional lymph nodes

Histology



Physiology

Pathology

Classification, Incidence, Pathology & Sequelae of acute Appendicitis

Classification, Incidence, Pathology & Staging of malignant tumors of the Appendix

### **Clinical skills**

Presentation and natural history of acute Appendicitis & its complications

The investigations available to efficiently diagnose the disease including the biochemical tests & imaging, & their limitations.

The treatment options(Conservative, Open Surgery & Laparoscopic)) available for the conditions and the results

### **Procedural skills**

Appendectomy Open & Laparoscopic

Explorative laparotomy for perforated Appendix

Drainage of an Appendicular abscess

## **Peritoneum, Omentum & Mesentery**

### **Contents**

#### **Core knowledge**

Anatomy

Anatomy of the peritoneal cavity & intra abdominal spaces

Anatomy of the omentum & omental bursae

Omental blood supply

Physiology

Physiological changes in acute peritonitis, fluid losses & Sepsis

Pathology

Etiology of the acute Peritonitis

Etiology & pathology of the intra abdominal abscesses

Omental trauma, etiology, mechanism, classification & complications

Pathology & classification of omental cysts

Pathology of the solid tumors of the Omentum (1ry & 2ry)

### **Clinical skills**

Clinical presentation & diagnosis of

Acute peritonitis

Intra abdominal abscesses

Torsion of the Omentum

Tumors of the Omentum (Cysts and Solid tumors)

Mesenteric trauma

Diagnostic work up including laboratory tests & Imaging Clinical presentation of acute peritonitis

Diagnosis of intra abdominal abscesses

Diagnostic work up including laboratory tests & Imaging for intra abdominal abscesses

Diagnosis of Omental trauma & recognition of complications

Presentation & clinical features of Omental cysts & solid tumors

## **Procedural skills**

- Exploratory Laparotomy
- Percutaneous drainage of intra abdominal abscesses
- Transrectal drainage (for pelvic abscess)

## **Gall bladder and Biliary Tract**

### **Core knowledge**

#### **Anatomy**

**Embryology** of the dorsal mesogastrium (liver, biliary tract, pancreas and spleen), diaphragm and potential anomalies.

#### **Gross Anatomy**

Liver

Anatomy of the hepatic ducts and biliary tree

Segmental duct anatomy and variations

Blood supply and lymphatic drainage

Relationship with other portal structures

Gallbladder and biliary tract

Anatomy of the gallbladder, cystic duct and bile ducts

Structure, relationship to other portal and adjacent structures

Sphincter of Oddi and Ampulla of Vater

Blood supply and lymphatic drainage

Variations and anomalies

Histology of gallbladder and biliary tract

#### **Physiology**

Biliary tract motility (including the gallbladder and sphincter of Oddi)

Biliary epithelium and gallbladder function

Factors in the production of biliary pain

#### **Pathology of the gallbladder and biliary tract**

Non neoplastic

##### **Gall stones**

The epidemiology, etiology, pathogenesis and complications of gallstones and Common bile duct stones

##### **Motility disorders**

Etiology and pathogenesis of biliary dyskinesia

##### **Biliary sepsis and obstruction**

The role of bacteria, endotoxins and cytokines in biliary sepsis

Etiology and pathophysiology of suppurative ascending cholangitis

Etiology and pathophysiology of obstructive jaundice

Epidemiology, etiology and pathogenesis of acute and Chronic cholecystitis, including acalculous cholecystitis

Empyema and emphysematous cholecystitis  
Etiology and pathophysiology of biliary peritonitis  
Epidemiology, aetiology, pathogenesis and complications of intrahepatic stones and recurrent pyogenic cholangitis  
Parasitic infections of the biliary tree – aetiology and pathology

### **Benign biliary strictures**

Cholecystectomy related bile duct strictures-classification, mechanisms of injury and complications.  
Sclerosing cholangitis- epidemiology, pathogenesis associated disorders  
Idiopathic and inflammatory strictures  
Biliary atresia

### **Biliary fistulas**

Etiology, pathogenesis and complications  
External  
Internal - including gallstone ileus and Mirizzi Syndrome

### **Biliary cysts including Caroli's Disease**

Epidemiology, etiology, classification, pathogenesis and complications

### **Blunt and penetrating trauma to the biliary tract**

Hemobilia and AV fistulas: Incidence, aetiology, pathogenesis and complications

### **Congenital**

Biliary atresia, congenital hepatic fibrosis, Alagille syndrome

### **Tumors of the gallbladder and biliary tract**

This section should include knowledge of the basic pathophysiology of neoplasia and mechanisms of carcinogenesis, genetic alterations, mechanisms of chronic inflammation and principles of tumour biology, mechanisms involved in the metastatic process

### **Benign tumors and pseudo tumors of the biliary tract**

#### **Tumors of the Gallbladder**

Benign: gallbladder polyps-incidence, etiology, pathogenesis and natural history

Malignant: incidence, etiology and pathogenesis, histological classification, molecular biology and patterns of spread.

Staging

#### **Intrahepatic and extrahepatic biliary cancer**

Pathophysiology of malignant obstructive jaundice

Hilar-cholangiocarcinoma: Incidence, etiology and histological classification

Patterns of spread

Genetics and molecular biology

Staging

## **Clinical skills**

### **Biliary Calculi**

- Biliary colic/ chronic cholecystitis
- Empyema/mucocoele
- Mirizzi syndrome
- Acalculous cholecystitis
- Gallbladder dyskinesia

Describe and differentiate the clinical features of these conditions

Describe the appropriate imaging and biochemical investigations to define and differentiate these conditions

Describe the relative risks of these conditions with associated co morbidities ex. portal hypertension

Detailed knowledge of operative and postoperative complications of cholecystectomy

Detailed knowledge of outcomes following various treatment options including QOL

Describe and evaluate the management of these conditions, including asymptomatic gallstones. This should include:

- A detailed knowledge of appropriate antibiotics and the management of sepsis
- Indications and options of conservative management, percutaneous, minimally invasive and open surgical techniques

### **Cholangitis**

Describe the clinical features and various presentations of obstructive jaundice and ascending cholangitis

Determine the optimum imaging techniques to detect CBD stones comparison and limitations

Detailed knowledge of the management of suppurative cholangitis including optimum antibiotic and supportive therapy

Detailed knowledge of various techniques of interventional access to CBD with outcomes

Timing and optimum techniques for combined treatment of CBD stones and cholecystolithiasis

### **Benign Biliary Strictures**

#### **Cholecystectomy related biliary injuries**

- Detailed knowledge of clinical presentation, classification and mechanisms of injury

- Recognition of bile duct injuries operative and postoperative

- Optimum imaging techniques to define the nature of biliary injury and other associated vascular or enteric injuries

- Ability to select the appropriate procedure (drainage, endoscopic, percutaneous and open surgical) for the emergency and elective management of bile duct injury and biliary strictures including the management of biliary peritonitis, biliary fistula and abdominal collections.

## **Primary Sclerosing Cholangitis (PSC)**

- Idiopathic
- Inflammatory
- Post traumatic

Detailed knowledge of clinical presentation, disease association

Management of PSC

Screening and biopsy for cholangiocarcinoma

Follow up protocols and detailed knowledge of potential long term complications following repair

## **Biliary fistulas**

- Internal
- External

Detailed knowledge of the various clinical presentations of internal and external fistulas including Mirizzi syndrome and gallstone ileus

An understanding of the optimum imaging techniques to define and characterize these fistulas

Management principles regarding the indications and appropriate techniques (conservative, endoscopic, percutaneous and laparoscopic) options for the treatment of fistulas

## **Biliary Cystic Disease**

- Choledochal cysts
- Caroli's disease

Awareness of various modes of clinical presentation, natural history, complications and associated conditions

A detailed knowledge of the most appropriate imaging techniques and laboratory tests to define the characteristics and extent and other associated pathology

Management of choledochal cyst based on type and extent of disease

Appreciation of the role of endoscopic and percutaneous techniques in emergency presentations and subsequent appropriate surgical procedures

Awareness of follow up protocol and potential complications

## **Tumours of the Gallbladder and Biliary Tree**

### **Benign tumours**

- Awareness of clinical presentation

- Knowledge of imaging modalities to distinguish between malignant and benign tumours of the gallbladder

- Principles of management including indications for resection and follow up protocols

- Natural history

### **Carcinoma of the gallbladder**

- Awareness of clinical presentation

- Knowledge of imaging and other investigations to diagnose and stage disease

- Complications

- General principles of perioperative management

- Indications for curative or palliative procedures and likely outcomes

- The role of chemotherapy or radiotherapy in a palliative, neoadjuvant or adjuvant

role  
Follow up protocols

### **Hilar cholangiocarcinoma**

Clinical presentation of hilar cholangiocarcinoma  
Knowledge of radiology, laparoscopy and biochemical tests to assess and stage of the disease  
Classification  
Complications  
Peri operative issues and management of the jaundiced patient including indications for biliary decompression  
Atrophy and portal venous embolization (PVE)  
Indications and suitability for resection  
The role of chemo/radiotherapy as neo/adjuvant or palliative setting  
Follow up protocols and quality of life scores

### **Procedural Skills**

#### **Gall stones**

Laparoscopic cholecystectomy  
Operative cholangiogram  
Technical options for the difficult cholecystectomy  
Open cholecystectomy  
Percutaneous cholecystotomy  
Open exploration of CBD including choledochoscopy, insertion of T tube, choledochoduodenostomy and sphincteroplasty  
Laparoscopic exploration of CBD including flushing, basket retrieval, choledochotomy and insertion of stents

#### **Biliary strictures**

Percutaneous and endoscopic options for emergency and elective situations  
Techniques of choledoscopy, balloon dilatation, biopsy of intrahepatic strictures  
Biliary stenting and dilatation via ERCP or PTC  
PTC or ERCP with stents  
The use of stenting techniques by endoscopic or percutaneous methods  
Enterobiliary anastomosis  
Biliary access loops, stents  
Bilioenterostomy with construction of Roux en y limb  
Duct-duct anastomosis  
Hepaticoenterostomy  
Bowel resection  
Enterotomy and closure  
Liver transplantation

#### **Biliary Cystic Disease**

Choledochal resection and biliary reconstruction

#### **Benign tumors**

Principles of resection:  
Laparoscopic or open surgical approaches  
Role of frozen section

## **Cholangio Carcinoma**

Staging laparoscopy and/or biopsy  
Surgical bypass procedures  
Percutaneous or endoscopic stenting procedures

## **Hilar Cholangio Carcinoma (Distal/CBD)**

Insertion of ports or abdominal wall incisions appropriate for the intended procedure  
Staging laparoscopy and biopsy  
Intra operative ultrasound and intraoperative cholangiography, choledochoscopy  
Laparoscopic and open cholecystectomy, subtotal cholecystotomy

## **Liver**

### **Core knowledge**

#### **Anatomy**

Embryology of the liver, biliary tract, pancreas, spleen and diaphragm with knowledge of the developmental anomalies

#### **Gross Anatomy**

Intrahepatic anatomy of the liver:

- Segmental anatomy and portal triad structures
- Hepatic veins and variants of normal
- Histology of the normal liver

Extrahepatic anatomy of the liver

- Anatomy of the porta and extrahepatic veins
- Portal vein, hepatic artery and anomalies
- Gallbladder and bile ducts and anomalies
- Lymphatic drainage and nodal anatomy

#### **Physiology**

- Bilirubin metabolism, bile production and synthesis
- Coagulation factors – synthesis and pathways
- Clinically relevant metabolic pathways of the liver
- Hemodynamics and regulation of hepatic blood flow
- Cellular function (hepatocytes, Kupffer cells, stellate cells)
- Liver immunology
- Hormonal influences on the liver and biliary tract

Interpretation of Liver Function Tests

Markers of cholestasis and cholangitis

Synthetic function: International normalized ratio (INR), clotting factors, albumin, bilirubin

Tumour markers: Carcino embryonic antigen (CEA), Alpha Feto protein (AFP)

Significance of liver function clearance tests Indocyanine green (ICG), monoethylglycinexylidide (MEGX )

## **Pathology of the Liver**

Mechanisms of liver regeneration

Underlying mechanisms involved in liver hyperplasia hypertrophy and atrophy

Interpretation of liver biopsy

## ***Non neoplastic disorders***

### **Liver Infections**

Viral infections

Inflammation, serological markers of disease activity prognosis and complications.

Pyogenic and fungal infections:

Classification, incidence, microbiology and pathogenesis of bacterial abscess, risk factors and natural history.

Amoebiasis and other parasitic infestations.

Hydatid disease

Terminology and classification, aetiology, life cycle development and complications; serological testing.

### **Acute Liver Failure**

Etiology and pathophysiology, complications and prognosis

Classifications

### **Chronic Liver Disease and Portal Hypertension**

Etiology, pathogenesis and natural history

Classification (Childs Pugh)

Pathophysiology and complications of portal hypertension

Pathophysiology of ascites

### **Vascular**

*Budd Chiari and venous occlusive disease*

Etiology pathophysiology and complications

*Hepatic artery aneurisms and its branches*

Etiology and pathology and complications

### **Liver Injury**

*Liver Trauma: (blunt and penetrating)*

Classification and mechanisms of injury, pathophysiology and complications

*Liver ischemia and ischemia reperfusion injury*

Etiology and pathophysiology

### ***Neoplasms of the Liver***

Mechanisms of carcinogenesis, genetic alterations, mechanisms of chronic

Inflammation and principles of tumor biology including the metastatic process.



## **Benign neoplasms:**

- Cystic disease
- Hemangioma
- Adenoma
- FNH
- Other benign lesions of the liver, local fatty change

Classification, histology, etiology and pathogenesis natural history

## **Primary malignancies**

- Hepatocellular carcinoma
- Epidemiology and risk factors, staging, pathology and pathogenesis, complications and natural history

- Cholangiocarcinoma (intrahepatic or peripheral )
- Epitheloid, hemangioendothelioma, lymphoma sarcoma and other malignancies

## **Secondary malignancies.**

- Colorectal
- Neuroendocrine
- Other secondaries (Breast, melanoma, renal, other GIT tumors)

Staging, pathogenesis, prognostic variables including molecular markers, natural history

## **Clinical skills**

### **Liver Failure**

#### **Acute Liver Failure**

- Classification system including Kings College Criteria
- Presentation, natural history and prognostic factors
- Investigations to diagnose, define etiology and prognosis
- Management strategy for acute fulminant hepatic failure including critical care supportive therapy,
- Define indications for extracorporeal support and surgery
- Types of liver support systems
- Liver transplantation – Cadaveric and live donor liver transplantation.

### **Chronic liver failure**

- Causes
  - Viral hepatitis
  - Alcoholic liver disease
  - Non alcoholic Steato hepatitis (NASH )
  - Autoimmune disease
  - Primary Biliary cirrhosis
  - Primary Sclerosing Cholangitis. (PSC)
  - Wilson Disease
  - Hemochromatosis

Alpha I antitrypsin deficiency  
Classification (Childs- Pugh)  
Clinical presentation  
Complications prognosis and natural history  
Interpretation of investigations to confirm cirrhosis, identify cause, and prognosis  
Identify complications such as malignancy, hepatic and portal vein thrombosis,  
Management strategy for chronic liver disease including the indications for  
medical, endoscopic radiological and surgical options  
Follow up protocols  
Preoperative assessment and risks of patients with cirrhosis undergoing non  
liver/shunt surgery

### **Ascites**

Clinical presentation  
Investigations to confirm ascites, including tests to differentiate ascites from lymphatic  
and malignant causes  
Tests to exclude infection  
Understanding of prognosis and complications  
Medical management of ascites  
The indications and outcomes of TIPS, peritoneo venous shunts and surgical  
decompressive shunts in ascites  
Indications and role of transplantation

### **Portal hypertension / Budd Chiari Syndrome**

Clinical presentations  
Investigations (radiology hematology biochemistry) to diagnose and define etiology  
Characterize the anatomy of portal hypertension, including sites of variceal bleeding  
Indications for portal decompression  
The indications and outcomes of endoscopic and radiological techniques & laparoscopic  
and surgical techniques  
Non operative strategies and medical management strategies [Esophageal sclerotherapy  
and banding , Variceal embolisation , Transjugular intrahepatic portosystemic shunt  
(TIPS) ]  
Risks and benefits of TIPS and surgical shunts for portal hypertension.  
Prognosis and complications  
Indications for liver transplantation

### **Liver Infections**

**Pyogenic fungal liver abscesses and other liver abscesses including amoebic  
abscess and TB**  
Clinical presentation  
Investigations to diagnose evaluate and identify possible sources and organisms  
Detailed knowledge of organisms, appropriate antibiotic therapy and length of  
therapy  
Indication for biliary tract imaging and decompression  
Management of liver abscesses including conservative, percutaneous endoscopic,  
and surgical options  
Indications for surgical management

## **Hydatid Liver Disease**

Classification, epidemiology and staging

Modes of clinical presentation

Radiological and serological investigation for detection and complications

Detailed knowledge of specificity and sensitivity of serological tests for diagnosis and follow up

Management of hydatid liver disease and its complications including role of anti helminthics as definitive or adjuvant /neoadjuvant to surgery including timing and length of administration

Surgical options including surgical, radiological and endoscopic

Complications including peritoneal rupture and dissemination,

Biliary tract involvement including rupture, Biliary bronchial/peritoneal fistulas

Follow up

## **Liver trauma**

Blunt and penetrating

Classification

Mechanisms of injury

Clinical presentation(s)

Investigations to define extent of injury and other injuries

Overall management principles and triage of liver trauma.

Principles of management of resuscitation, sepsis, coagulation and multi organ support

Indications for operative or non operative management

Assessment of the options of minimally invasive or open surgical intervention

Role of radiological embolisation, vascular stenting percutaneous techniques

ERCP and biliary stents including timing and role Laparoscopy and liver debridement and drainage of sepsis including timing

Role of laparoscopic, endoscopic and radiological invasive techniques

Complications

Prognosis

## **Liver tumours**

### **Benign lesions**

Hemangioma

Focal nodular hyperplasia (FNH)

Adenoma

Other benign tumours

Hepatic incidentaloma

Classification

Patterns of Clinical presentation

Differential diagnosis

Optimum investigations for assessment and differentiation of benign lesions of the liver

Role of liver biopsy

Management strategies including the role of conservative management, and the indications for resection

Complications and natural history

Follow up protocols

## **Malignant lesions**

### **Primary**

#### **Hepatocellular carcinoma(HCC)**

Clinical presentations

Classification and staging

Investigations – radiological biochemical and haematological to diagnose and stage the disease

Tumor and molecular markers

Relative merits of CT scan, PET, MRI

Management principles of the treatment of HCC

Focal ablative techniques and trans arterial Chemo embolization (TACE): indications, limitations and relative merits including complications, patient survival and as bridge to transplantation

Role of resection

Multi disciplinary team interactions

Indications for resection

Nomenclature for liver resections

Evaluate the co-morbidities of patients for liver resection

The role of neo/adjuvant chemotherapy

Assessment of chemotherapy on liver function and residual liver function following liver resection

Indications for portal vein embolisation

Impact of prognostic variable (clinical, radiological and molecular markers) on survival

Assessment of residual liver function

Criteria for transplantation: Milan, University of California, San Francisco (UCSF), Pittsburgh etc

The palliative management of HCC including ascites jaundice and haemorrhage

Outcomes and results including Quality of life scoring.

Knowledge of the complications and natural history

### **Metastatic**

Colorectal,

Non Colorectal cancer

Renal, Breast

Neuroendocrine/ Nonneuroendocrine(NNE), Melanoma,

Staging

Clinical presentation

Role of PET, CT, MRI, laparoscopy in diagnosis

Management principle for the treatment of CRC liver metastases including the relative merits of surgery, chemotherapy, focal ablation and SIRT

The role of adjuvant/ neo adjuvant chemotherapy in CRC liver metastases including a knowledge of the commonly used chemotherapy agents, toxicity and implications in timing of liver resection

Laparoscopy and indications for biopsy

Intraoperative staging: assessment of resectability at laparotomy and laparoscopy

Follow up protocols of patients following resection for CRC liver metastases.

## **Procedural skills**

## **Cirrhosis of the Liver**

Liver biopsy by laparoscopy, percutaneous, open and

Percutaneous aspiration of ascites under ultrasound guidance

Surgical techniques in patients with ascites undergoing surgery such as abdominal wall hernias etc

Surgical techniques in patients with portal hypertension undergoing non shunt surgery eg. cholecystectomy, hernias

## **Liver infections**

Percutaneous, laparoscopic and open surgical drainage of liver abscesses

## **Liver trauma**

Operative assessment of abdominal injuries

Liver packing, lacerations, debridement, omental pedicle

## **Liver Tumors**

Liver biopsy

Enucleation

Open and laparoscopic liver resection

- Place abdominal incisions and ports for intended procedure

- Staging laparoscopy, liver biopsy - assessment of resectability at laparoscopy or

- Laparotomy

- Intra operative ultra sound scanning

- Perform liver resections (open) using a variety of approaches and transection techniques

- Vascular control: none, Pringle maneuver, total vascular isolation

- Types of liver resection ( Nomenclature of liver resection using Brisbane system)

- Non anatomic, segmental, Subsegmental resection, lobectomy, extended lobectomy

- Insertion of vascular infusion devices

Radio frequency ablation (RFA)

## **Pancreas and Duodenum**

### **Core knowledge**

#### **Anatomy**

Anatomy of the pancreas

- Spectrum of normal anatomy and variants including pancreatic divisum and annular pancreas

- Arterial supply and venous drainage

- Lymphatic drainage and regional lymph nodes

- Relationship with major arterial and venous structures and adjacent organs including bile duct

- Anatomy of the pancreatic duct including normal/abnormal variants

- Histology of pancreas

Anatomy of the Duodenum

- Spectrum of normal anatomy and variants

- Lymphatic drainage and regional lymph nodes

Relationship with major arterial and venous structures and adjacent organs including bile duct  
Histology of duodenum

### **Physiology (Pancreas and Duodenum)**

Exocrine enzyme physiology –synthesis, excretion and activation  
Neural and hormonal influences of exocrine secretion  
Endocrine metabolism – islet cell function, neuroendocrine hormones  
Mechanisms of pancreatic pain  
Regulation of duodenal motility  
Neuroendocrine (gut) hormone physiology

### Investigations of the Pancreas and Duodenum

Markers of pancreatic injury  
Measurement of exocrine and endocrine pancreatic function  
Markers of blood and urinary endocrine hormones  
Interpretation of pancreatic tumor markers  
Interpretation of biopsy – pancreas, duodenum and ampula

### **Pathology (Pancreas and Duodenum)**

#### *Non neoplastic*

#### **Acute Pancreatitis**

Definition and classification of Pancreatitis  
Acute Pancreatitis  
Etiology and pathogenesis of acute pancreatitis including extra pancreatic organ manifestations  
Assessment of severity  
Hemodynamic, biochemical and metabolic abnormalities  
Complications  
    Pancreatic necrosis: pathogenesis and natural history  
  
    Pancreatic fistulas  
    Pathophysiology and complications  
  
    Pancreatic Pseudocysts  
    Natural history and complications  
  
    Pancreatic vascular manifestations  
    Haemorrhage, thrombosis

#### **Chronic Pancreatitis**

Etiology, pathophysiology and natural history

#### **Pancreatic and duodenal injuries**

Epidemiology, pathophysiology and mechanisms of injury  
Classification

### **Pancreatic Infections**

- Pancreatic abscess
- Fungal infections
- TB

### **Congenital anomalies of the pancreas and pancreatic duct**

- Pancreatic Divisum
- Annular pancreas
- Von Hippel Disease

### ***Neoplastic conditions of the Pancreas and Duodenum***

#### **Benign Cysts and Neoplasms of the Pancreas**

A knowledge of the classification, etiology, pathogenesis, histology and natural history is required of the following conditions:

- Microcystic serous adenoma
- Mucinous cystic neoplasm
- Intraductal papillary mucinous neoplasia (IPMN)
- Solid pseudo-papillary tumours
- Neuroendocrine tumours

#### **Malignant Tumors of the Pancreas**

- Histological classification

#### **Primary adenocarcinoma**

- Epidemiology and risk factors
- Pathogenesis - genetics and molecular biology, pathology and patterns of spread
- Staging and classification

**Metastatic** disease to the pancreas-renal cell, melanoma, colorectal

#### **Lymphoma of the pancreas**

#### **Endocrine tumours of the pancreas**

- Classification and pathogenesis

#### **Ampullary and duodenal tumors**

- Staging and histological classification
- Epidemiology, risk factors, pathogenesis and association with other diseases
- Patterns of spread and natural history

## **Clinical skills**

### **Pancreas**

#### **Pancreatitis**

##### **Acute Pancreatitis**

Classification of acute pancreatitis

Various modes of clinical presentation

Radiological biochemical and haematological tests for diagnosis, etiological factors and assessment of severity and prognosis

Diagnostic tests to define complications including pancreatic infection

Management principles of acute pancreatitis and its complications including use of antibiotics nutrition and septic complications

Supportive and critical care principles

Indications for endoscopic and surgical intervention

Organ failure and SIRS

##### **Chronic Pancreatitis**

Autoimmune pancreatitis, Inflammatory mass (head of pancreas)

Clinical presentation

Imaging

Biochemical, haematological and immunological tests to diagnose and characterize the disease

Assessment and diagnosis of complications

Management principles including decision making in the indications for conservative, endoscopic or surgical management

Strategies to diagnosis and manage the inflammatory pancreatic mass

Appraisal of diagnostic tests to diagnose and characterize site of bleeding following acute pancreatitis or post operative pancreatic resection

#### **Pancreatic Divisum**

Clinical significance and methods of presentation and natural history

Indications and options of treatment including conservative, endoscopic and surgical techniques

#### **Pancreatic pseudocysts**

Classification

Clinical presentation and natural history

Radiological tests

Indications for treatment including timing and method of intervention (Endoscopic, radiological or Surgical)

Treatment of complications

Results and outcomes

#### **Pancreatic Fistulas and ascites**

Classification

Clinical presentation(s)

Imaging techniques to diagnose and characterize fistulas

Management principles of pancreatic fistula including treatment of sepsis, nutrition, pancreatic secretion suppression and general supportive therapy

Indications of specific therapy including conservative, endoscopic and surgical options, ERCP and stenting



## **Portal and splenic vein thrombosis**

Clinical presentation

Clinical presentation and radiological assessment and characterization (US, duplex, CT MRI angiography and portography)

Management of bleeding including algorithm of plan of management.

Options of endoscopic, arteriographic and surgical techniques with knowledge of outcomes and prognosis

Options of conservative, radiological (embolic) and surgical treatment of bleeding varices secondary to portal vein and splenic vein thrombosis

## **Congenital Anomalies**

Annular pancreas

Ectopic and accessory pancreas

Duodenal diverticulum

Aplasia, hypoplasia of pancreas

Pancreatic divisum

Pancreatic cysts

Variations of the venous, arterial and ductal drainage of the pancreas including pancreatic divisum

Knowledge of the significance, clinical presentations and natural history of these conditions

Radiological techniques to diagnose and characterize these abnormalities

Significance of the anomalies and Indications for intervention

Other pathological conditions with the various anomalies Angiography and embolisation

## **Pancreatic duodenal trauma**

Modes of clinical presentation and mechanisms of injury

Radiological, hematological and biochemical tests for diagnosis and definition of injury

Knowledge of complications and natural history

Management of pancreatic trauma with options of conservative endoscopic or surgical (open or laparoscopic) techniques

Follow up

## **Neoplastic Conditions**

### **Benign cysts and neoplasms**

Serous, mucinous cystadenoma

IPMN

Cystic pancreatic incidentaloma

Classification and differentiation of pseudocyst and duodenal diverticulum

Clinical presentations of cystic pancreatic tumors and differential diagnosis

A detailed assessment of radiological (CT, US MRI) cytological, biochemical molecular markers to differentiate between benign, premalignant and malignant cystic tumors of the pancreas

The role of endoscopic ultrasound

Management protocol including indications of conservative therapy or intervention

Follow up protocols

## **Malignant tumors (Primary) - Pancreatic adenocarcinoma**

- Clinical presentation
- Radiological and other tests to diagnose and stage the disease
- Nutritional support
- Indications for biliary decompression
- Indications for resection
- Indications for biopsy
- Choosing appropriate resection technique
- Role of neo/adjuvant therapy and/ or chemotherapy
- Follow up protocols including quality of life assessment
- Palliative options of endoscopic, radiological or surgical techniques for pain, gastric outlet obstruction, jaundice
- Knowledge of outcomes of these procedures including long term survival and complications
- Management of post operative complications

## **Duodenum**

### **Duodenal and Ampullary tumors**

- Clinical presentation
- Staging, classification and associated syndromes
- Imaging techniques including the role of EUS and biopsy Management options including conservative, curative or palliative strategies
- Screening and surveillance in FAP
- Follow up
- Chemo preventative therapy
- Indications for biliary decompression
- Place for ERCP ,Palliative endoscopic or radiological decompression
- Place for Laser or Argon plasma ablation of duodenal polyps

## **Procedural skills**

### **Acute Pancreatitis**

- Operative recognition of acute pancreatitis
- Laparoscopic cholecystectomy in acute gallstone pancreatitis
- Intervention therapy using endoscopic, arteriographic and laparoscopic techniques
- Necrosectomy including open, laparoscopic, endoscopic and percutaneous techniques
- Peritoneal lavage
- Placement of and types of drains; principles of sump drainage and peritoneal lavage

### **Chronic Pancreatitis**

- Endoscopic stenting of main or accessory pancreatic duct and CBD
- Extra corporal shock wave Lithotripsy (ESWL) /Endoscopic lithotripsy for stones
- Laparoscopic and open pseudocyst drainage procedures
- Whipple, distal pancreatectomy

### **Pseudo cyst**

- Gastrostomy/enterostomy Pseudocyst gastro enterostomy
- Surgical approaches to haemorrhage, perforations, gastric outlet obstruction
- Feeding jejunostomy

ERCP

Endoscopic insertion of pancreatic stents

### **Pancreatic trauma**

Triple tube decompression

Pyloric exclusion procedures

Drainage

Operative assessment of pancreatic duct injury

Distal pancreatectomy (spleen preserving)

Internal drainage

Pancreaticojejunostomy

Whipples

### **Neoplastic Conditions**

Abdominal incisions and placement of ports for appropriate procedure

Staging laparoscopy, intraoperative ultrasound

Palliative options:

    Gastrojejunostomy

    Hepatojejunostomy by open surgical techniques

    Duodenal stenting, CBD and pancreatic stenting

Pancreatic resection:

    Whipple's

    Distal pancreatectomy

### **Duodenal and Ampullary tumour.**

Kocherisation of the duodenum

Duodenotomy and identification of the main and accessory papilla and pancreatic ducts at operation

Whipple's

## **Spleen & Diaphragm**

### **Core knowledge**

#### **Anatomy**

##### **Spleen**

Spectrum of normal anatomy and relationship to adjacent structures

Developmental anomalies including site of possible splenunculi

Normal and anomalous anatomy of splenic venous and arterial blood supply including patterns of segmental branching

##### **Diaphragm**

Embryology and composition of the diaphragm

Knowledge of the attachments of the diaphragm and traversing structures

Relationships of adjacent organs

#### **Physiology**

##### **Physiology of the spleen**

Immune and haematological function of the spleen

Interpretation of tests of immune spleen function

## **Pathology**

### **Spleen**

Etiology and pathogenesis of hypersplenism

Etiology, pathophysiology and prognosis of hyposplenism including Overwhelming post splenectomy sepsis (OPSI)

Splenic Infarct and abscesses

Parasitic Infections of the spleen including Hydatid disease

Splenic Tumours

Benign: splenic cysts

Malignant: lymphoproliferative disorders, sarcoma, hemangiothelioma

Etiology, pathology and natural history

Vascular

Splenic vein thrombosis

Splenic artery aneurism

Etiology, pathophysiology and complications

## **Clinical skills**

### **Spleen**

#### **Splenic Trauma**

Staging of splenic trauma

Mechanisms of injury

Clinical presentation

Radiological investigations to diagnose, stage splenic injury as well as other injuries

Management principle of splenic trauma including the indications of conservative , radiological (angiography) and open surgical intervention

The complications and relative merits of these techniques

Complications and natural history of splenic trauma

Detailed knowledge of acute and long term complications of splenectomy

Management of the complications of splenic trauma including long term management and follow up of OPSI

#### **Splenic tumors**

Primary and secondary /cystic and solid

Clinical presentation

Radiological investigation to differentiate the pathological nature

#### **Splenic Artery Aneurisms**

Clinical presentation

Radiological tests, management principles including conservative, radiological and surgery

Occlusive techniques

## **Procedural Skills**

### **Spleen**

Splenectomy for trauma

Splenorrhaphy

Splenectomy for massive spleens, portal hypertension and tumours

Ligation of splenic artery aneurisms

# Inflammatory Bowel Disease

## Learning objectives

Clinical presentation, diagnosis, management and follow up of ulcerative colitis . Cancer risk and screening for colorectal cancer in pan-colitis, sub-total and left sided colitis.

## Essential core knowledge

Surgical anatomy of the large intestine rectum and anal canal

Physiology of the large intestine rectum and anal canal

Understand and execute medical management

Be aware of the tiers of pharmacologic management and understand the pharmacokinetics and side effects of sulphasalazine, 5-ASA preparations, corticosteroids, azathioprine and 6-mercaptopurine in the management.

Knowledge on use of anti-TNF alpha agents, ex.- Infliximab.

Be aware of and understand the need for antibiotics in the management of colitis.

Complications of ulcerative colitis and Crohn's disease.

Management of complications; massive GI bleed, perforation, fulminant colitis, toxic megacolon including strictures.

Be aware of indications for emergency and elective surgical intervention.

Management of appendicitis associated with colitis, both Crohn's disease and ulcerative colitis.

Assessment and risk stratification of the patient awaiting colectomy for ulcerative colitis.

Principles of operation in restorative proctocolectomy with an ileal pouch.

The indications for an ileal J pouch vs. S pouch.

Principles of surgical management of Crohn's colitis.

## Clinical skills

History and examination. Be able to identify extra-intestinal manifestations of IBD.

Appropriate investigations

Resuscitation in fulminant colitis and peritonitis

Decision making- conservative Vs surgical and early Vs delayed

Role of non-operative management

Operative options

Pre and post operative management

Management of complications – bleeding, perforation, toxic dilatation, abscess, stricture and fistula.

## Procedural skills

Emergency colectomy

Hartmann's procedure

Emergency ileostomy – open and laparoscopic

Emergency colostomy

Restorative proctocolectomy with a pouch

Restorative proctectomy with a pouch

Double stapled pouch-anal anastomosis

Stapled and hand sewn ileal pouch construction

Endo-anal mucosectomy

Endoanal ileal pouch-anal anastomosis  
Ileo-caecal resection (open) for Crohn's disease  
Small bowel stricturoplasty  
Take-down of Crohn's fistulas  
Management of Crohn's fistulas of the anal margin (See under anal fistulas)  
Assessment of anal sphincters before pouch surgery. (See under anal incontinence)

## **Large bowel infections**

### **Learning objectives and core knowledge**

Be aware of the acute bacterial infections of the large intestine  
Be aware of emerging knowledge of intestinal helminthic infection.  
Be aware of antibiotic induced colitis.  
Be aware of common viral infections of the gut including cytomegalovirus infection in transplant recipients on immunosuppression and in those with HIV aids.  
Tuberculosis of the gut, mechanism of infection and the granuloma

### **Clinical skills**

Historical differentiation between infection and inflammation  
Examination of the abdomen and general status of a patient.  
Be able to differentiate the "surgical abdomen" from gut infection  
Assess and treat hydration and monitor improvement in patients with gut infection.  
Be able to identify perforation in gut infection.  
Identify the haemolytic – uraemic syndrome.  
Identify portal pyaemia.  
Investigate the patient with abdominal tuberculosis.

### **Procedural skills**

Obtain stool for analysis.  
Stool cultures.  
Colonoscopy and biopsy.  
Laparoscopy and biopsy in a patient with abdominal T.B.

## **Constipation and Obstructed Defecation**

### **Learning objectives and essential core knowledge**

Large and small bowel motility  
Whole gut and large bowel transit, Western vs. Asian subjects.  
Physiology of defecation  
Metabolic causes of constipation  
Diabetes and constipation  
Pseudo-colonic obstruction.  
Spinal cord injury and alteration in large bowel motility.  
Clinical presentations  
Drugs in the causation and management of constipation  
Knowledge of biofeedback training, both motor and sensory  
Knowledge of the brain – gut axis.

### **Clinical skills**

Focused history and examination of an individual with slow transit  
History and examination in an individual with obstructed defecation  
Detailed examination of the perineum  
Differentiation between failure of anal canal relaxation and puborectalis paradox  
Examination for spinal cord injury and its effects on the perineum.  
Recognize faecal impaction  
When and how to Investigate constipation  
Be aware of methods of psychometric testing.  
Perform and analyze a dietary survey .

### **Diverticulosis of the colon**

#### **Learning objectives and essential core knowledge**

Understand the essential differences between left and right colon diverticulosis  
Understand the mechanism and theories of left colonic diverticulosis  
Presenting features  
Methods of diagnosis  
Complications of diverticulosis  
Hinchey classification in diverticular sepsis  
The role of interventional radiology in diverticular sepsis  
Non-operative management including dietary advice  
Diverticulosis in young age individuals

#### **Clinical skills**

Clinical presentation  
Diagnostic work up  
Recognizing complications in diverticulosis  
Recognize fistulating disease in diverticulosis  
Manage peritonitis in diverticular perforation  
Manage acute bleeding in diverticulosis  
Differentiate between mass of diverticular origin versus cancer  
Understand guidelines (American Society, British Society) for operative excision of diverticulosis.  
Be aware of the extent of resection required to prevent recurrence of symptoms  
Recognize complications of operation early.

#### **Procedural skills**

Colonoscopy  
Perform segmental resection in diverticulosis, open and laparoscopic.  
Stoma surgery  
Resection of diverticular fistula –Rectovesical, rectovaginal  
Perform partial resection of the urinary bladder  
Methods to locate and protect ureters from injury in operation on a diverticular mass.  
Be able to decide on diversion if required intra-operatively.  
Hartmann operation.

## **Colorectal cancer**

### **Learning objectives**

Clinical presentation of colorectal cancer, and clinical diagnosis

Diagnostic modalities

Work-up and treatment of colon cancer

Work up and treatment of rectal cancer

Management of colon and rectal cancer

Follow up.

Screening for colorectal cancer.

Possess basic knowledge of anti-cancer medication, including the biological agents such as vascular endothelial growth factor (VEGF) and epithelial growth receptor factor (EGFR). Be aware of current regimes of chemotherapy for large bowel cancer, including side-effects.

### **Clinical Skills**

History and examination

Investigations

Endoanal-ultrasound for staging

Decision making- Conservative Vs surgical and early Vs delayed

Operative options

Resuscitation in intestinal obstruction and peritonitis

Pre –and Post operative management

Management of complications

Role of non-operative management

Management of large bowel obstruction, including post-operative strictures.

Pre-operative and intra-operative bowel preparation

Assessment and risk stratification of the patient awaiting large bowel surgery

Prevention and management of post-operative ileus.

Surgical intensive care management

Surgical nutrition

Antibiotic prophylaxis

### **Procedural skills**

Segmental large bowel resection

High, low and extended low anterior resection

Straight vs. pouch colo-anal anastomosis

J vs. Transverse coloplasty pouch

Trans-anal resection including trans-anal endoscopic micro-surgical techniques

Reresection for rectal cancer, abdominal hysterectomy

Colonoscopy, colonoscopic polypectomy. Colonoscopic submucosal resection.

Trans-colonoscopy stenting and balloon dilatation of strictures

## **Colorectal and intestinal polyps**

Presentation of polyps

Diagnosis

Management

Screening for polyps and cancer



Familial cancer including polyposis syndromes  
Prevention  
Obtaining a family history / Amsterdam criteria  
Genetics of colorectal polyps and cancer  
Maintaining a polyposis registry

## **Miscellaneous conditions**

### **Volvulus**

Etiology and diagnosis based on history and examination,  
Interpretation of the plain abdominal radiograph  
The value of serum biochemistry  
The role of contrast study of the large bowel and the technique of endoscopic decompression of a sigmoid volvulus.  
Be aware of the role of prokinetics and stimulants of large bowel contractility and the pharmacokinetics of these agents.  
Develop the skill to know when to operate on patients with volvulus.  
In volvulus, be guided by the principles of large bowel resection in an emergency setting, the effects of revascularization of a previously ischaemic segment of large bowel, the limits of resection in prevention of anastomotic leakage which are higher than conventional large bowel anastomosis,  
Be aware of the mortality rate associated with surgical treatment of volvulus  
The role of endoscopic guided two-point fixation of the sigmoid colon volvulus in individuals not deemed fit to undergo operation.

### **Megacolon**

In megacolon and megarectum, the practitioner should be able to make a diagnosis and request supportive investigations to assist in diagnosis Control of diabetes in megacolon,  
Be able to interpret anorectal physiology related to Hirshsprung's disease and to perform anorectal strip biopsy, including correct specimen orientation to help a pathologist in diagnosis.  
Be familiar with colo-anal pull through operations for Hirschsprung's disease.  
Be familiar with techniques of antegrade lavage.

### **Pseudo-obstruction**

In pseudo-obstruction, make a diagnosis, look for an aetiology and treat with prokinetics or be familiar with colonoscopic decompression.  
Be familiar with the "blow-hole" stoma in management of impending perforation.

**Melanosis coli** – Aetiology, diagnosis by endoscopy and biopsy and treatment of constipation and laxative abuse.

## **Anorectum**

### **Rectal prolapse and other forms of prolapse.**

#### **Learning objectives and essential core knowledge**

Understand the pathology of rectal prolapse.

Be aware of differences in rectal prolapse between patients from the West and Asia.  
Understand the mechanism of constipation and incontinence in rectal prolapse.  
Be aware of rectal prolapse as a part of global pelvic floor failure.  
Understand the principles of surgery for rectal prolapse; perineal versus abdominal.  
Management of rectal prolapse in children

### **Clinical skills**

History and examination of a patient with rectal prolapse.  
Detailed examination of the perineum.  
Examination for uterovaginal prolapse  
Determine the need for perineal versus abdominal procedure for prolapse.

### **Procedural skills**

Colonoscopy  
Abdominal suture rectopexy with and without sigmoid colon resection  
Perineal rectosigmoidectomy  
Delorme's operation for prolapse  
Laparoscopic rectopexy

## **Faecal incontinence**

### **Learning objectives and essential core knowledge**

Aetiology of faecal incontinence  
Knowledge of obstetric trauma and faecal incontinence  
Evaluation of faecal incontinence  
Faecal incontinence scoring systems  
Anatomy of the pelvic floor; cadaver, ultrasound anatomy, magnetic resonance and operative surgical anatomy  
Drugs in faecal incontinence and mechanism of action.

### **Clinical skills**

History and examination of a patient with faecal incontinence.  
Focused digital examination of the anorectum and its sphincter complex.  
Ability to decide on non-operative versus operative management.  
Ability to decide on optimal surgical approach for patients requiring operative intervention.  
Interpretation of anorectal physiology data  
Interpretation of ultrasound anatomy of the anal sphincter complex and understand the Differences between western patients and South Asian patients.  
Correlate incontinence scores with quality of life and the need for intervention.  
Follow up protocol in patients with faecal incontinence.  
Knowledge of defaecating proctography.  
Stoma construction.  
Repair of rectovaginal fistula.

## **Haemorrhoids**

### **Learning objectives and essential core knowledge**

Anatomy of the anal canal and the anal cushions

Anatomy of the anal sphincter complex.  
Vascular anatomy of the anal cushions  
Ultrasound anatomy of the anal canal.  
The origin of haemorrhoids.  
Classification of haemorrhoids.  
Complications of haemorrhoids.  
Principles of management.  
The role of microflavanoids.  
Understand the significance of “alarm” symptoms.  
The physics of ultrasound, lasers and doppler flowmetry in assessment and treatment.

### **Clinical skills**

Obtain a focused history and examine the patient with haemorrhoidal symptoms.  
Possess knowledge of when to investigate an individual for proximal sources of bleeding.  
Be aware of the importance of excluding blood disorders (leukaemia) and disorders of coagulation before undertaking operative treatment.  
Differentiate between bleeding haemorrhoids and anorectal varices.  
Differentiate thrombosed haemorrhoids from external plexus haematoma and a sentinel tag.  
Manage complications of injection and banding.  
Post-operative care of the patient after anoscopic injection or banding.  
Management of prolapsed and thrombosed piles.  
Prevention of urinary retention in treatment of haemorrhoids.  
Manage post-haemorrhoidectomy pain.

### **Procedural skills**

Position and preparation of the patient for examination on a couch.  
Anoscopy.  
Anoscopy + injection sclerotherapy, band ligation.  
Open and closed haemorrhoidectomy.  
Stapled haemorrhoidopexy.  
Doppler guided ligation of haemorrhoidal arteries (HAL).  
Anoscopic ligation of the haemorrhoidal vessels.  
Management of anal stenosis / cicatrisation.

## **Anal abscess and fistula**

### **Learning objectives and essential core knowledge**

Developmental anatomy of the anal canal and the anal glands  
Ultrasound and magnetic resonance anatomy.  
Histology of the anal glands.  
The origin of anal abscess.  
Pathogenesis of anal abscess.  
Classification of anal abscess.  
The origin of primary anal fistula.  
Secondary causes/ association of anal fistula.

Principles of investigation.  
Principles of management .  
Complications.  
Issues related to quality of life

### **Clinical Skills**

History and focused examination of the patient with anal abscess and fistula.  
Determine the location of an anal abscess.  
Know when to investigate individuals further.  
Determine the internal opening of a fistula and correlate its path with the corresponding external opening.  
Identify a horse-shoe track.  
Perform terminal ileal endoscopy in a patient suspected of Crohn's fistula.  
Interpret contrast enhanced fistulograms  
Differentiate soiling associated with fistula from true anal incontinence.

### **Procedural skills**

Position and examine a patient under anaesthesia for fistula disease.  
Administer an anal field block.  
Drainage of an anal abscess including principles of managing a concomitant fistula and prevention of anal sphincter injury.  
Drainage of an anal inter-sphincteric, ischio-anal abscess and supra-coccygeal abscess.  
Identify the anatomy of an anal fistula track using peroxide, methylene blue, intra-operative anal ultrasound.  
Be able to perform core anal fistulotomy.  
Insert drainage and cutting setons.  
Perform seton fistulotomy.  
Prevent iatrogenic injury to the anal sphincter complex during fistulotomy.  
Use of the trans-anal advancement flap for high fistula.  
Perform muscle flap advancement for complex anal fistulas with cavitation and tissue loss.  
Understand the indication for and use of anal fistula plugs.  
Understand the principles and execution of tissue glue for anal fistulas.  
Perform ligation of an inter-sphincteric fistula tract (LIFT).  
Undertake concomitant anal sphincter repair with fistulotomy.

### **Anal fissure**

#### **Learning objectives and essential core knowledge**

Anal canal anatomy and mucosal blood supply.  
The internal anal sphincter in anal fissure.  
Principles of medical management of anal fissure  
The role of nitric oxide in pathogenesis of anal fissure.  
Understand the nitric oxide and calcium channel pathways in smooth muscle relaxation in the gut  
Pharmacology of medication used to treat anal fissure.  
Complications of surgical management of anal fissure.  
The diminishing role of anal manipulation for anal fissure.

### **Clinical skills**

History and examination

Be able to recognize elevated resting anal tone.

Differentiate between normotensive and hypertensive anal canals.

Identify fissure due to low nitric oxide levels versus Crohn's disease.

Identify fissure related fistula disease.

Identify features of underlying occult anal sphincter damage.

### **Procedural skills**

Application of topical anaesthesia, in examination of fissure

Anal field block.

Tailored lateral internal anal sphincterotomy.

Advancement flap repair for normotensive anal fissure.

The use of 0.5 -1% GTN paste and 2% diltiazem cream as chemical sphincterotomy.

The use of warm Sitz baths in reducing anal sphincter tone.

Techniques of internal anal sphincter augmentation in post-sphincterotomy incontinence.

## **Anal cancer**

### **Learning objectives and essential core knowledge.**

Definition of the anal margin.

Understand the etiology and pathogenesis of anal cancer.

Histological types of anal cancer and staging of anal cancer.

Association between human papilloma virus infection and anal cancer.

Principles of diagnosis.

The role of irradiation.

Management by surgical excision.

Management of inguinal nodes.

Follow up of anal cancer.

### **Clinical skills**

History and examination of the anal canal and groin nodes.

Recognize Paget's disease of the anal margin.

Recognize leukoplakia.

Work-up of the patient with anal cancer

### **Procedural skills**

Perform biopsies of the anal margin.

Local excision of localized anal cancer.

Abdomino-perineal excision with end-colostomy.

### **Miscellaneous conditions**

**Only the more significant learning objective / clinical skill and performance skill will be included here. Further training in these areas must be prompted by individual enthusiasm and will.**

**Pruritus ani**- Aetiology, appropriate history, treatment schedules including advice, steroid based topical agents and injection of methylene blue intra-cutaneous.

**Solitary rectal ulcer** – aetiology, appropriate history, endoscopic diagnosis, management of complications such as haemorrhage, diagnostic biopsy and histopathologic features, non-operative treatment after appropriate investigation, surgical excision.

**Proctalgia fugax** – classical history, diagnosis by clinical exam and investigation of defaecation, counseling patient and biofeedback techniques.

**Perineal pain** – Aetiology and examination based on focused history. Referred pain, pre-sacral lesions. Appropriate targeted investigation and treatment. Surgical excision and surgical excision which may involve sacral resection as well. One must understand the upper limit of sacral resection, techniques of preventing pre-sacral haemorrhage, management of pre-sacral haemorrhage and prevention of a neuropathic urinary bladder.

**Radiation proctitis** – Be aware of the pathological changes in radiation proctitis, symptomatology and diagnosis made by endoscopy and biopsy. Familiarize yourself with 4% formalin contact therapy and the effects after contact therapy. Be aware of the role of argon plasma coagulation in radiation proctitis. Understand that a proximal diverting stoma has little, if not, no role in treatment.

## **Acute emergencies**

### **Trauma of the small and large bowel**

#### **Learning objectives and essential core knowledge**

The mechanisms of intestinal trauma

Pathophysiology of intestinal trauma

Iatrogenic trauma (electrocautery, laparoscopic port insertion, during endoscopy)

Resuscitation and management

The role of radiology

Conservative versus operative management

Post-operative management.

Intestinal stomas

#### **Clinical skills**

Perform focused assessment by sonography in trauma (FAST) scan.

Resuscitate a trauma patient.

Decision regarding emergency laparotomy

Decision to perform damage limitation surgery

Manage intestinal fistulas

#### **Procedural skills**

Undertake FAST scans

Insert a central venous line with and without ultrasound guidance

Undertake emergency laparotomy  
Techniques of damage limitation surgery  
Site a stoma in an emergency operation  
Techniques of laparostomy and vacuum assisted closure (VAC) of the anterior abdominal wall.

## **Lower gastrointestinal Hemorrhage (LGIH)**

### **Learning objectives and essential core knowledge**

Vascular anatomy of the intestinal tract including Dieulafoy lesions.  
Red cell lifespan, breakdown, iron metabolism and biochemical assessment, including iron and storage levels in serum.  
Transfusion of blood and blood products. Massive blood transfusions and its complications.  
Pharmacology of anti-coagulants, anti-platelet agents and reversal of the action of these  
Recognize and manage LGIH  
Resuscitate patients with LGIH  
Differentiate between upper and lower GIH.

### **Clinical skills**

Obtain a focused history and examine the patient with LGIH  
Investigate anemia of unknown origin  
Investigation of LGIH: Radiology and nuclear medical investigation in LGIH.  
Interventional procedures.  
Be sensitive to timing of operation when interventional radiologic facilities are not available.  
Be sensitive to lowering of core body temperature, methods of preventing fall in temperature.  
Stay updated on current guidelines in management of LGIH

### **Procedural skills**

Upper GI endoscopy.  
Lower GI endoscopy in an acute situation on unprepared bowel.  
Injection sclerotherapy.  
Argon-laser photocoagulation techniques.  
Endoscopic clipping.  
Be aware of and interpret capsule endoscopy.  
Laparotomy, bowel resection, anastomosis.  
Intra-operative endoscopy, lavage and trans-illumination techniques.  
Intra-operative recognition of diverticula of small bowel, Meckel's diverticulum and angio-dysplasia.

## **Stoma care**

### **Intestinal stomas**

### **Learning objectives and essential core knowledge**

Anatomy of the intestinal tract

Anatomy of the anterior abdominal wall.  
Sites of bowel used in stoma construction  
Physiology and alteration in physiology of the intestinal tract associated with stomas.  
Indications for a stoma  
Complications specific to stomas  
Pharmacology of agents like somatostatin analogues, loperamide, opiates, diphenoxalate.  
in Stoma care  
Counseling and quality of life in patients with a stoma  
Be aware of stoma care societies.

### **Clinical skills**

Develop the art of counseling an individual receiving a stoma  
Be able to consider individual life situations, personal needs, occupational needs and quality of life issues, including dress, in deciding the optimum site of a stoma.  
Recognize the site of origin of a stoma  
Recognize and differentiate between end-stomas and loop –stomas.  
Be up to date with current stomal appliances, the use of transparent versus opaque stomal appliances, the use of drainable pouches, one vs. two piece systems, the management of base plates and wafers, the use of stomal adhesive pastes and techniques to enable re-use of some components.  
Recognize the following complications ; Stomal ischaemia, retraction and stenosis. Para-stomal hernia, prolapse of a stoma. Skin complications – excoriation, ulceration, product allergy, dermatitis, fungal infection.  
Manage and treat ileostomy flux.

### **Procedural skills**

Construction and closure of an end-colostomy.  
Construction and closure of a loop colostomy.  
Construction and closure of an end-ileostomy.  
Construction and closure of a loop ileostomy.  
Construction of a Malone stoma antegrade irrigating stoma.  
Construction of an ileal conduit.  
Construction of a continent Koch pouch of ileum.  
Construct a feeding jejunostomy  
Insert a percutaneous endoscopic gastrostomy (PEG) tube.  
Correctional /revisonal surgery for stomal complications such as re-site a stoma, surgery for prolapse, stenosis, retraction.

## **Minimal access Surgery**

### **Laparoscopic large bowel surgery**

#### **Learning objectives and essential core knowledge**

Laparoscopic anatomy of the peritoneal cavity including the pelvis.  
Laparoscopic anatomy of the large bowel , rectum and small bowel.  
Patient positions in laparoscopic surgery.  
Laparoscopic systems, types of cameras, the physics of insufflation, setting up in



laparoscopy.

Ensuring equipment safety during use.

Electrocautery, indications, safety procedures, diathermy machines and electrocautery settings.

Contra-indications of laparoscopic surgery.

Ports; port designs, self retaining ports and methods of securing ports.

Anaesthetic complications of laparoscopic surgery, early recognition and corrective steps.

### **Clinical skills**

Understand the indications for laparoscopic large and small bowel surgery including its limitations.

Be able to recognize contra-indications to laparoscopic surgery.

Be able to recognize post-operative complications early and take appropriate corrective action.

### **Performance skills**

Basics of laparoscopic instrument and port placement, prevention of “sword-fighting” and general concepts of target organ oriented placement of ports.

Placement of clips including clip sizes, use of clip applicator and haemolock clips.

Appropriate and correct use of intra-corporeal suction.

Techniques of anti-fogging during laparoscopic surgery.

Be familiar with laparoscopic staplers and the mechanisms of open, closure, fire and re-load.

Techniques of intra-corporeal and extra-corporeal knot placement.

Use of ultrasound shears during laparoscopic surgery and trouble shooting.

Before undertaking laparoscopic large bowel surgery, it is recommended that the practitioner should have performed a minimum of 20 laparoscopic appendectomy procedures, 15 laparoscopic cholecystectomy procedures and assisted in at least 10 laparoscopic large bowel operations.

It is recommended that the individual attend a hands-on laparoscopic course and be mentored during the first 5 laparoscopic large bowel operations taken on as principle operator and that the practitioner should have good hand skills at intra-corporeal knotting on the bench.

A recommended step-wise approach to achieving skills at laparoscopic large bowel surgery would be as follows;

**Laparoscopic appendectomy;** ( Mobilisation of the caecum, identifying retroperitoneal structures, intra-corporeal knot placement +/- intra-corporeal suture placement).

**Laparoscopic cholecystectomy;** ( Fine dissection, recognition of important structures safely, judicious use of suction, safe use of electrocautery)

**Laparoscopic Colorectal surgery;** First assistant in large bowel laparoscopic surgery (Strategic placement of ports, securing port placement, methods of introducing swabs into the peritoneal cavity, technique of safe traction and counter-traction, retraction and extra-corporeal suture retraction of pelvic organs, ex: the uterus, and retroperitoneal anatomic relations of the right colon, left colon and the rectum.)

Step-wise approach as principle operator;

Re-learning fascial planes in laparoscopic surgery

Technique of medial to lateral dissection, anatomic landmarks in the right colon, left colon and the rectum, take-down of hepatic and splenic flexures.

Laparoscopic segmental colonic mobilization.

Laparoscopic intra-corporeal vascular clipping and / or suture ligation.

Laparoscopic suture rectopexy of rectal prolapse.

Laparoscopic assisted segmental resection of the ileo-caecal region and/ or the sigmoid colon for benign disease including safe delivery of a specimen, extra-corporeal anastomosis.

Hand-assisted laparoscopic surgery may be undertaken at anytime now on the learning curve if you feel this way inclined to help your skills progress.

Laparoscopic intra-corporeal anastomosis.

Laparoscopic total mesorectal excision and colorectal anastomosis. You may undertake hybrid procedures at this point, including laparoscopic mobilization of the left colon and splenic flexure followed by open resection and anastomosis via a Pfannensteil approach.

Laparoscopic restorative proctocolectomy.

\*(Acquisition of skills must be accompanied by frequent audit, evaluation of technique after operation, preferably by review of procedure videos and discussion and attending up-date lectures and courses)

## **ENDOSCOPY TRAINING**

It must be emphasized that Endoscopy training should not be confined to the acquisition of motor skills alone. It should also include much broader knowledge such as the ability to interpret various findings at Endoscopy. Trainees are also encouraged to acquire procedures found in the advanced Endoscopy module whenever possible.

### **Core knowledge**

- Endoscope design, function and capabilities
- Use and complications of Diathermy
- Knowledge of the design and function of the various Endoscopic accessories
- Endoscope sterilization (WHO guidelines)
- Endoscopic unit design and management

### **Clinical skills**

- Appropriateness and correct indication
- Obtaining informed consent
- Patient preparation (including bowel preparation in lower GI procedures)
- Patient safety
- Safe administration of sedation and monitoring of the patient
- Patient aftercare
- Documentation
- Record keeping

### **Procedure skills**

#### **Upper GI Endoscopy**

- Diagnostic Endoscopy with biopsy and Chromo Endoscopy
- Therapeutic Endoscopy
  - Sclerotherapy,
  - Variceal banding
  - Glue injection
  - Thermal hemostasis
  - Clip insetion
  - Balloon dilatation (Strictures and Achalasia)
  - Stenting (Esophagus)
  - PEG insertion

#### **Lower GI Endoscopy**

- Diagnostic lower GI Endoscopy with biopsy (and Chromo Endoscopy) and tattooing
  - Proctoscopy
  - Sigmoidoscopy (Rigid and Flexible)
  - Colonscopy
- Therapeutic Endoscopy
  - Snare plectomy
  - Hemostasis ( Ligation. Endoloop, thermal hemostasis, injection techniques)
  - Balloon dilatation
  - Stenting

## **Annex 2. FORMAT FOR DETAILED PROJECT PROPOSAL**

### **Section 1**

1. Name of trainee
2. Name(s) of supervisor(s)
  - I
  - II
3. Training centre

### **Section 2**

1. Project title
2. Background and justification
3. Objectives of study
4. Research plan
  - a. Design
  - b. Setting
  - c. Method
  - d. Sample size and sampling techniques
  - e. Outcome measures
  - f. Statistical analyses and plan of presentation of results
  - g. Ethical considerations
  - h. Work plan and time lines
5. References
6. Funding for study

-----  
Signature of trainee

**Section 3**

Recommendation of supervisor(s)

-----  
Signature of Supervisor 1

Date

-----  
Signature of Supervisor 2

Date

**Section 4**

Date of submission to PGIM

Date of approval by BOS

Signature of Secretary BOS

## **DISSERTATION SUBMISSION FORMAT**

### **General instructions**

It is advisable to start writing the dissertation early (before the data collection is completed). The manuscript has to be word-processed using Microsoft Word. Supervisor should be consulted before start writing and at regular intervals thereafter. The draft has to be printed on only one side of the paper.

The past tense should be used. The draft has to be within the given word limit (approximately 8000 words). The metric system and the International System (SI) of units should be used whenever possible.

### **Layout**

The dissertation should be printed on A4-size photocopying paper (single-side only). Layout of typescript should be 1.5” on left-hand and top margins, and 1.0” on right-hand and bottom margins. The left-hand (binding) margin is of the regulatory size. Line spacing should not be less than 1.5. The font has to be Times New Roman, size 12. All pages should be numbered consecutively throughout, including appendices. Page numbers has to be inserted in the bottom right hand corner.

### **Tables, diagrams, maps and figures**

Wherever possible, these should be placed near the appropriate text. Tables should be numbered in continuous sequence throughout the dissertation. Maps, graphs, photographs, etc., should be referred to as Figures. Each of these should also be numbered in a continuous sequence. Colour should be avoided in graphic illustrations (unless it is essential) because of the difficulty of photographic reproduction; symbols or other alternatives should be used instead.

Foot notes, if essential, should be inserted, in reduced font, at the foot of the relevant page. If too voluminous for this to be practicable, they should be placed in an Appendix. Notes may be typed in single spacing.

### **Abbreviations**

Where abbreviations are used, a key should be provided.

### **Number of copies**

Three copies should be submitted to the Director/ PGIM, spiral-bound in the first instance. One will be retained in the PGIM, one will be sent to the internal examiner and one to an overseas examiner. After acceptance (and necessary corrections), all three copies should be bound in hard covers (black) with the author’s name, degree and year printed in gold on the spine. The front cover should carry the title, author’s name and year printed in gold. One copy will be returned to the trainee, one retained by the supervisor, and the third will be kept in the PGIM library

## **Preliminaries**

The preliminaries precede the text. They should comprise the following:

1. Title page
  - Title of the dissertation
  - Name of the Author
  - MD (GI Surgery)
  - Postgraduate Institute of Medicine, University of Colombo
  - Date of submission
2. Statement of originality: The work presented in the dissertation should be the trainee's own and no part of the dissertation should have been submitted earlier or concurrently for any other degree. The statement should be signed by the author, and countersigned by the supervisor.
3. Abstract: Should be structured (introduction, objectives, method, results, conclusions) and should not include figures, tables, graphs or references. The abstract should be limited to 500 words.
4. Table of contents: The table of contents immediately follows the abstract and lists in sequence, with page numbers, all relevant divisions of the dissertation, including the preliminary pages.
5. List of tables: This lists the tables in the order in which they occur in the text, with the page numbers.
6. List of figures: This lists all illustrative material (maps, figures, graphs, photographs etc.) in the order in which they occur in the text, with the page numbers.
7. Acknowledgments

## **Text**

The dissertation should be divided into clearly defined chapters. Chapters may be subdivided and a decimal number system can be helpful to identify sections and subsections. Topics of the sections should not be mixed. (e.g. Results should not appear in the Materials and Methods).

### Section 1

**Introduction:** The current position and the reasons for carrying out the present work (Rationale /Justification and problem/s identified and quantified.) Hypothesis and expected outcome, impact and relevance of the study should be stated. Generally, only a few references should be cited here.

### Section 2

**Literature Review:** This section should be reasonably comprehensive, and most of the references to be quoted have to be in this section. The relevant references dealing with the general problems should be reviewed first and this should be followed by a detailed review of the specific problem. The review is in many cases approached as a historical record of the development of knowledge of the subject.

### Section 3

**Objectives:** Clearly defined and general, specific and any subsidiary objectives should be stated.

#### Section 4

**Materials and Methods:** Appropriate study design to address the objectives with clear detailed description of subjects, sampling technique and sample size, interventions, data collection and management. The study should be, internally valid and reproducible. Where specific details are available in the literature, reference should be made to the original papers, and comments kept to a minimum. If modifications have been made to the published techniques, these should be described in full. Appropriate statistical tests planned should be mentioned and ethical issues addressed

#### Section 5

**Results:** Presentation of data should be in a logical sequence commencing with the basic / baseline characteristics of the subjects. Summarize the data with a figure, table or graph when appropriate Present appropriate statistical analyses and interpretations. Each figure, table or graph should be complete and clear without reference to the text. Concise explanations in legends and explanation of abbreviations are needed. The text should complement the figure, table or graph and not simply describe them but should give valid interpretations of the results. Complete (raw) data should not be included but should be contained in tables in an Appendix if needed. Only data from the present study should be included and in particular and no comparison should be made at this stage with results from other studies.

#### Section 6

**Discussion:** Interpret and explain the results so as to provide answers to the study question(s). Comment on the relevance of these answers to the present knowledge of the subject. Consider alternate interpretations. Comment on interesting or unexpected observations and about the method. Critically compare the results with results and conclusions of other published studies within and outside the country, and explain possible reasons for any differences observed. Comment on unexpected outcomes and also comment on further follow-up research required on the subject.

#### Section 7

**Limitations:** Any inherent and / or inadvertent limitations / biases and how they were dealt with should be described

#### Section 8

**Conclusions and recommendations:** Based on the results of the study and to address the objectives

#### Section 9

##### **References**

References are very important and must be complete and accurate so that the reader can refer to the original papers for further study. Therefore all literature referred to should be listed in a consistent form and style, and must contain sufficient information to enable the reader to identify and retrieve them.

Uniformity is essential, but errors and inconsistencies are very common and authors are advised to check the references most carefully. Examiners will mark students down for inconsistencies in their references (either omissions or failure to follow the recommended format as given in the following section).



There are different styles of citing sources, listing references and compiling a bibliography. The Vancouver style is widely accepted in scientific writings, and is recommended for MD (Surgical Oncology) dissertation. List all references that are cited in the text, using the Vancouver System

Type the references double - spaced in the Vancouver style using superscript numbers and listing full references at the end of the paper in the order in which they appear in the text. Online citations should include date of access. Use Index Medical for journal names. If necessary, cite personal communications in the text but do not include in the reference list. Unpublished work should not be included. References should be listed in the following style:

1. The arrangement of the references at the end of the dissertation should be in numerical order as they are cited in the text.
2. The order of the items in each reference should be:
  - a. For journal references: name(s) of author(s), title of paper, title of journal, year, volume number, and page numbers.
  - b. For book references: name(s) of author(s), title of book, edition, volume, town of publication, publisher. Year, chapter and/or page number
3. Authors' names should be in roman letters and followed by the initials (Ex. Moor JL, Peery SH).
4. Where an author's name is repeated in the next reference it should also be spelt out in full.
4. The title of the paper is then included, without quotation marks. The journal title should be unabbreviated, *in italics*, and be followed by year; **volume number in bold** (the issue /number): and the first and last page numbers.

## **DISSERTATION MARKING SCHEME**

The two examiners appointed by the Board of Study in GI Surgery shall use the following marking grid to allocate marks for the dissertation.

1. Title (05)
2. Author's name and address
3. Abstract (10)
4. Table of contents
5. List of tables
6. List of figures
7. Introduction (20)
8. Objectives (15)
9. Review of literature (20)
10. Materials and methods (50)
11. Results (40)
12. Discussion (including limitations) (45)
13. Conclusion and recommendations (if any) (10)
14. Acknowledgements
15. References (15) (Vancouver system should be used)
14. The overall presentation (20 marks)

Two examiners will be appointed by the Board of Study in GI Surgery to assess and award a mark independently out of 100 using the marking system described above. The final mark for the dissertation out of 200 shall be the total of the marks given by each examiner.

To Pass the Dissertation the trainee should score 60 % or more. If the mark obtained is less than 60% the trainee should resubmit the Dissertation at a prescribed date after attending to the recommended amendments and improvement, for reassessment by the same pair of examiners. At the repeat assessment the maximum mark to be awarded shall be 60%. This process will be continued in the same manner until the minimum 60% is obtained.

### Annex 3. Format for the log book

No	Name	Age	Sex	BHT No / Hospital	Procedure/ Surgery	Date of Surgery	Outcome	Signature of the Supervisor
1								
2								
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13								
14								
25								

## Annex 4. Portfolio for GI Surgery trainees

### 1. LOG OF PROCEDURES CARRIED OUT (See Annex - 3)

### 2. WORK BASED ASSESSMENT

#### 2.1 CASE BASED DISCUSSION

Date	Case/Summary	Trainer's Assessment *	Comments	Signature of the Trainer

\* Assessment tools

- Clarity of the presentation
- Ability to summarize and prioritise the problem/s
- Ability to take appropriate course of actions and to have alternative plans
- Ability to show the up to date knowledge on the subject
- Ability to use the available tools/ resources effectively and consideration of the cost/ benefits
- Willingness to seek help from the expertise / refer to appropriate center / seek second opinion where necessary

\* Method of assessment

- E - Excellent
- S - Satisfactory
- N - Needs improvement
- P - Poor

## 2.2 DIRECT OBSERVATION OF PROCEDURE SKILLS

Date	Procedure	Trainer's Assessment *	Comments	Signature of the Trainer

\* Assessment tools

- Surgical technique (handling of tissues, dissection and reconstruction of tissues, haemostasis)
- Ability to complete the procedure
- Ability to take appropriate course of actions and to have alternative plans in difficult situations
- Ability to use the available tools/ resources effectively and consideration of the cost/ benefits
- Willingness to seek help from the expertise / refer to appropriate center / seek second opinion where necessary
- post operative management and management of complications

\* Method of assessment

- E - Excellent
- S - Satisfactory
- N - Needs improvement
- P - Poor

### 3. LECTURES and TEACHING (undergraduates / postgraduates/ nurses)

Activity	Date	Topic/s	PG/Intern/MS/Nurses	Signature of the Trainer
Teaching a Group (Ward class/ OP Theatre/Endoscopy unit)				
Bed- side Clinical Teaching				
Teaching a Practical Procedure ( One to one / small group)				
Lecture				
Organization of Teaching Seminars/Workshops				

### 4. CME activities

Event	Date	Trainee's role (O, Re, P)*	Details (topic/s)	Signature of the Trainer

\* O- Organized / Re- Resource person / P- Participant

### 5. RESEARCH and Publications

Event/ Journal	Date	Details*	Topic	Signature of the Trainer

\*OP- Oral presentation  
 PP- Poster presentation  
 OA- Original article  
 RE – Review article  
 CP – Case presentation / record  
 O- Other

## 6. INFORMATION TECHNOLOGY

Activity	Date	Details	Signature of the Trainer
Ability to use computer software (MS-Word/Excel chart/ Access)			
Managing a Database			
Statistical analysis (SSPS)			
Literature Search using PubMed			

\* Excellent (E)/ Satisfactory (S)/ Needs improvement (N)/ Poor/ (P)

## 7. PROFESSIONAL DEVELOPMENT

Activity	Date	Remarks*	Signature of the Trainer
Audit			
Pathology meeting			
Radiology meeting			
MDT meeting			
Prepare or Revise a Guideline or Care-pathway			
Journal Club			

\* O- Organized / AP- Active Participant / P- Participant

## 8. MEDICO LEGAL ISSUES

Activity	Date	Review date	Remarks*	Signature of the Trainer
Consent				
Next of kin issues				
Divulging of information				
Breaking bad news				
Management of dying patient				

\* Excellent (E)/ Satisfactory (S)/ Needs improvement (N)/ Poor/ (P)

## **9. SUMMARY OF TASKS**

**No of Case based discussions (CbD) [ ]**

**No of Direct Observation of Procedural Skills (DOPS) [ ]**

**Lectures / teaching sessions [ ]**

### **CME Activities**

**Presentations [ ]**

**Attending specialized training away from place of work [ ]**

**Workshops / Clinical meetings [ ]**

**Research projects Y/ N**

**Publications [ ]**

**Audits [ ]**

**Pathology meetings [ ]**

**Radiology meetings [ ]**

**MDT meetings [ ]**

**Journal clubs [ ]**



## Annex 5. Format for progress reports on GI Surgery trainees (During the period of training abroad)

**Name of the trainee:**

**Period of training:**

**Speciality:**

**Hospital and unit:**

**Country:**

**Name of the Consultant**

### Clinical skills

	Excellent	Good	Average	Poor
Theoretical knowledge				
Clinical decision making				
Clinical skills				
Operative skills				
Ability to cope with emergencies				
Ability to cope with				
Seek appropriate consultations				
Quality of documentation				

### General

	Excellent	Good	Average	Poor
Availability/punctuality				
Dedication to work				
Professional attitudes				
Reliability				
Professional attitudes				
Ability to follow instructions				
Communication skills				
Doctor-patient relationship				
Relationship with colleagues				
Relationship with other staff				
Other Comments				

## **Annex -6. Advanced Training Modules**

In GI surgery there are three areas (Upper GI, Hepatobiliary and Colorectal) which require special attention by trainees as well as trainers, because of the clinical significance of these areas. During the three year training in GI surgery trainees may wish to have more intensive training in one of these areas. Training in these advanced modules pre-supposes that the basic training in GI is being undertaken successfully. Depending on the local and abroad training as well as personal circumstances they may concentrate on completing one of these advanced modules during their training period. If they wish they may complete the advanced module after the board certification.

### **Upper GI Surgery – Advanced modules**

#### **Esophagus**

##### **Clinical skills**

Knowledge about the etiology and pathophysiology of the end stage esophageal disease and ability to clinically diagnose them

Knowledge and some experience of rare esophageal tumors

##### **Procedural skills**

##### **Surgery for malignancy**

Laparoscopy assisted/ Thoraco Laparoscopic en bloc resection (2 field, 3 field lymph node resection)

##### **Surgery for Hiatal hernia, gastroesophageal reflux**

Re operation for failed repairs

##### **Surgery for oesophageal strictures**

Re operation for failed repairs

##### **Achalasia cardia**

Procedures for failed myotomy

##### **Esophageal perforation**

Procedures late presentations/ esophageal fistula

#### **Stomach**

##### **Clinical skills**

Knowledge about the etiology and pathophysiology of Gastroparesis and ability to clinically diagnose and perform the appropriate investigations

Knowledge and some experience of rare tumors of the Stomach

**Procedural skills**

R3 Gasterctomy for advanced Gastric cancer  
Remedial operative procedures for recurrent Ulcer & complications following previous procedures

**Small Bowel, Appendix, Omentum & Peritonium****Core knowledge**

Understand the process of adaptation to intestinal failure and progress over the time  
Be aware of the metabolic and GI complications of the short bowel syndrome

**Clinical skills**

Ability to clinically recognize, investigate and classify and grade the severity of the intestinal failure.  
Understands and advice on the appropriateness or not and timing of surgical solutions for short bowel syndrome  
Ability to diagnose and manage intestinal dismotility and the etiological factors  
Ability to diagnose Omental cysts and their deferential diagnoses  
Knowledge and some experience of rare tumors of the Small intestine, Omentum, Peritonium and Appendix

**Procedural skills**

Ability to manage complex post surgical complications especially recurrent enterocutaneous fstulae  
Procedures for short bowel syndrome  
Small intestinal transplantation  
Procedures for recurrent intestinal obstruction due to adhesions  
Surgical procedures for rare tumors of the Small intestine, Omentum, Peritonium and Appendix

## **Hepatobiliary (HPB) Surgery – Advanced module**

**Perioperative care in advanced Hepatobiliary Surgery****General principles in the perioperative care of patients with HPB disorders****Objectives**

1. Demonstrate the ability to manage the perioperative assessment and complications of patients with Hepatobiliary disorders.
2. Develop a detailed perioperative and operative strategy for liver, biliary and pancreatic resections based on preoperative assessment and imaging of the patient with HPB disease.
3. Assess the overall risk of surgery by recognizing the implications of abnormalities of liver hematologic and biochemical testing on both hepatic and non-hepatic procedures.
4. Demonstrate a detailed knowledge of the impact of comorbidities and other risk

- factors on the impact of management of HPB disease.
5. Evaluation of the high risk patient in HPB surgery - correlation of ASA and APACHE scores with operative morbidity and mortality in HPB disorders.
  6. Prognostic effect of obstructive jaundice on perioperative morbidity and measures to minimize these effects.
  7. The impact of renal failure on the jaundiced patient and strategies to minimize these effects.
  8. The impact of cirrhosis and portal hypertension, Childs Pugh score on non shunt surgery.
  9. Disorders of coagulation and management.
  10. Minimizing the impact of diabetes and cardiorespiratory disorders on HPB surgery.

## **Contents**

Perioperative complications and critical care management in patients with complex HPB disorders including:

Preoperative assessment of liver function prior to surgery including Hepatic risk for Surgical conditions.

Assessment of liver function, portal hypertension.

Volumetric assessment of liver remnant.

Requirements and assessment of portal vein embolization.

Prophylaxis against common complications.

Understanding of DVT prophylaxis and treatment.

Measures to prevent sepsis.

Neuroendocrine hormonal blockade.

Detailed operative plan based on preoperative Imaging.

Management of complications.

Liver failure, encephalopathy.

Bleeding and coagulation disorders.

Vessel occlusion syndromes: hepatic artery, portal vein hepatic veins.

Biliary, pancreatic and enteric fistula and abdominal collections.

## **Sepsis**

Acquire a detailed knowledge of the various syndrome of systemic sepsis and their management including multi organ failure and supportive therapy.

Management of abdominal collections and abscesses.

Radiological percutaneous techniques for abdominal collections: indications and outcomes.

Approaches to peritoneal sepsis.

Knowledge of the spectrum of organisms involved in sepsis associated with HPB diseases.

Knowledge of common antibiotics used in the treatment of HPB sepsis including indications and toxicity.

Gut enteric organisms - translocation and pathogenesis in HPB sepsis.

Selective bowel decontamination.

## **Nutrition**

Nutritional assessment: identification of malnutrition and nutritional risk factors.

Specific metabolic and nutritional problems associated with HPB disease: jaundice, pancreatic insufficiency, pancreatic sepsis.

Alterations in metabolism following major hepatic or pancreatic resection.  
Indications and timing for perioperative nutrition enteral or parenteral.  
methods of administration: jejunostomy, nasoenteric, parenteral.  
The role of preoperative nutrition in malignancy, obstructive jaundice and pancreatitis.  
Principles of dietary immunomodulation.  
Basic understanding of calorific requirements and protocols in nutrition.  
Complications of parenteral and enteral nutrition.

## **Imaging**

### **Objectives**

Understand the physics and technology of Ultrasound and Doppler, CT Scan, MRI Scan, PET Scan and other nuclear imaging procedures including biliary excretion scan (HIDA), RBC scan, Octreotide scan and radionuclide Liver-Spleen Scan.

Understand the relative advantages, disadvantages and indications of each modality.

Interpret the detailed information provided by the imaging of the liver biliary tract, pancreas duodenum and spleen to the clinical situation.

Perform and interpret intraoperative ultrasound.

### **Contents**

The applied physics and technology of Ultrasound, Doppler, CT scan, MRI scan, PET scan, radionuclide Liver Spleen Scan and other nuclear medicine imaging procedures.

The interpretation of images and application to clinical investigations.

Imaging algorithm for the investigation of hepatobiliary, pancreatic and splenic disorders including:

- Cystic lesions of the liver, pancreas and spleen.
- Non cystic lesions of the liver, pancreas and spleen.
- Biliary dilatation and /or jaundice.
- Periampullary tumours.
- Biliary strictures.
- Gallstones including biliary and gallbladder dyskinesia.
- Pancreatitis and pancreatic inflammatory lesions.

### **Clinical Skills**

Apply the understanding of the relative merits of each imaging modality to efficiently investigate and stage lesions of the liver, biliary tract pancreas and spleen.

Interpret images to correctly identify normal structure, anomalies and pathological abnormalities.

Integrate the findings of the various images with the clinical situation.  
Perform and interpret intra operative ultrasound.

## **Oncology**

### **Objectives**

Understand the mechanisms of action of the classes of chemotherapeutic agents currently available for HBP malignancies.

Understand the physics, mechanism of action and technology of radiation therapy. Apply this understanding to the multidisciplinary management of HBP malignancies.

### **Contents**

#### Chemotherapy

Knowledge should include:

Classes of drugs

Mechanisms of action

Toxicities

Combination therapy and available protocols

#### Radiation therapy

Applied physics and technology

Mechanism of action

Toxicity

Combination protocols with chemotherapy

#### Multidisciplinary management

Relative roles of surgery, ablation, chemotherapy and radiation therapy as:

Definitive management

Neo- and adjuvant therapy

Therapy for recurrent disease

Palliative therapy

### **Clinical Skills**

Apply knowledge of tumor biology, chemotherapy and radiation therapy to recommend an appropriate treatment strategy for the management of individual HBP malignancies.

Participate regularly in multidisciplinary tumor review conferences.

Interact with interventional Radiologists, Medical Oncologists, Radiation Oncologists, Oncology Nurses and Allied Health Professionals, Palliative Care Physicians and Nurses

## **Gall bladder and Biliary Tract**

### **Procedural Skills**

#### **Biliary strictures**

Biliary and liver resection for complex biliary strictures

## **Biliary Cystic Disease**

Associated liver and pancreatic resections

## **Cholangio Carcinoma**

Radical cholecystectomy, liver resection

Lymph node clearance

Vascular reconstruction

## **Hilar Cholangio Carcinoma (Distal/CBD)**

Radical cholecystectomy and Portal lymph node clearance

Vascular and biliary reconstruction techniques

Whipples procedure, portal node dissection

Liver resection and hepaticoenterostomy with access loop

Biliary duct reconstruction

Duct to duct anastomosis

Intrahepatic cholangioenterostomy : right and left lobes

Duodenal exclusion procedures

# **Liver**

## **Procedural skills**

### **Cirrhosis of the Liver**

Liver biopsy by transjugular routes

Modified surgical techniques in patients with cirrhosis undergoing non liver or shunt surgery

TIPS and peritoneo venous shunt

Decompressive surgical shunts

Liver transplantation

Shunt surgery: portacaval, splenorenal, mesocaval and variants

Local devascularization procedures

### **Liver trauma**

Vascular injuries and repair

### **Liver Tumors**

Laparoscopic liver resection

Place abdominal incisions and ports for intended procedure

Staging laparoscopy, liver biopsy - assessment of resectability at laparoscopy or

Laparotomy

Intra operative ultra sound scanning

Types of liver resection ( Nomenclature of liver resection using Brisbane system)

Perform liver resections (Laparoscopic, laparoscopic-assisted) using a variety of approaches and transection techniques

Vascular control: none, Pringle maneuver, total vascular isolation

Open Liver resections

Non anatomic, segmental, Subsegmental resection, lobectomy, extended lobectomy

- Staged resections
- Two stage hepatectomy, ex situ surgery, total vascular exclusion
- Combination with ablation
- Insertion of vascular infusion devices
- Vascular resection and reconstruction
- Various parenchymal transaction techniques
- Modified techniques for fatty, fibrotic and cirrhotic parenchyma
- Concomitant resection of IVC, diaphragm, portal vein and bile duct
- Extrahepatic nodal clearance

Transplantation  
Palliative techniques

## **Pancreas and Duodenum**

### **Clinical skills**

#### **Pancreatic lymphoma, Pancreatic metastases (Renal, melanoma colorectal) & Pancreatic incidentaloma**

- Clinical presentation
- Radiological and haematological tests to diagnose and stage the disease
- Management plan of the pancreatic incidentaloma
- Management plan regarding conservative or interventional treatment for pancreatic lymphoma and metastases

#### **Endocrine tumors of the pancreas including adult Nesidioblastosis**

- Classification
- Presentation and differential diagnosis of various syndromes from secreting tumors
- MEA syndromes
- Radiological hormone assays and other tests to detect and stage
- Options of management including conservative, medical, resection by laparoscopic and open techniques
- Knowledge of medical therapy including suppression and chemotherapy
- Antisecretory medication
- Management of metastatic disease , chemotherapy, focal ablative, Selective internal radiation therapy (SIRT), resection , chemo- embolisation and infusion.

### **Procedural skills**

#### **Chronic Pancreatitis**

- Pancreatic sphincteroplasty to main or accessory pancreatic ducts
- Lateral pancreaticojejunostomy
- Freys or Begers procedures
- Total pancreatectomy
- Central pancreatectomy
- Denervation procedures, coeliac axis block

#### **Pseudo cyst**

- Endoscopic cyst gastrostomy
- Radiological percutaneous drainage
- Radiological cystgastrostomy



Pancreatic resection  
Management of Pancreatic haemorrhage

### **Pancreatic Divisum**

Accessory papilla sphincteroplasty  
Pancreatico jejunostomy  
Pancreatic resection

### **Pancreatic Fistulas and ascites**

Pancreaticoenteric bypass techniques  
Pancreatic resection  
Endoscopic stenting  
Radiological drainage

### **Neoplastic Conditions**

Abdominal incisions and placement of ports for appropriate procedure  
Staging laparoscopy, intraoperative ultrasound  
Palliative options:

- Hepatojejunostomy by laparoscopic techniques
- Nerve ablation techniques

Pancreatic resection:

- Central pancreatectomy, total pancreatectomy
- Pancreatico duodenectomy including pyloric preserving, spleen preserving and duodenal preserving pancreatectomy
- Portal vein resection and vascular reconstruction.
- Pancreatic tumour enucleation
- Retroperitoneal node dissection

### **Endocrine tumours**

Laparoscopy, intraoperative ultrasound  
Techniques of localisation at operation including intraoperative US, monitoring protocols of blood sugar, venous sampling  
Techniques to differentiate malignant and benign disease  
Pancreatic resection :

- Enucleation
- Central pancreatectomy, distal pancreatectomy (spleen preservation).
- Whipple's procedure

### **Benign cysts**

Laparoscopic and /or open surgical techniques for pancreatic cystic tumours  
Local enucleation techniques  
Pancreatic resection:  
Whipples, central pancreatectomy,  
Spleen preserving distal pancreatectomy,

### **Duodenal and Ampullary tumour.**

Local transduodenal resection by endoscopic, laparoscopic and surgical techniques  
Pancreatic preserving duodenectomy

# Colorectal Surgery – Advanced module

## Tests of Anorectal physiology

### Learning objectives and essential core knowledge

Anatomy of the anal canal and anal sphincters  
Anatomy of sacral nerve roots, formation of the pudendal nerve and its branches.  
Anatomy of the neural reflexes in the anal canal including the autonomic nerves  
Physiology of anal and rectal sensation.  
Physiology of defaecation and pathophysiology of disorders of defaecation.  
The physiology of colonic and intestinal transit.  
Electrophysiology of the anal sphincter complex, including neurophysiology of the pudendal nerve.  
The basis of tests of anorectal physiology.  
Types of manometry catheters and optimum dimensions.  
Cortical evoked responses and the value of assessment in disorders of the anal canal.  
Tests of rectal compliance and principles of the barostat.

### Clinical skills

Focused history and psychological evaluation of a patient with defaecation disorder.  
Interpret results of anorectal physiology.  
Recommend management for patients with abnormal physiology tests.

### Procedural skills

Perform continuous pull-through and station pull-through manometry.  
Understand and perform vector manometry and sphincter fatigue indices.  
The recto-anal inhibitory reflex.  
Anal sensory testing.  
Assessment of rectal volumes.  
Saline continence testing.  
Surface and needle electromyography of the anal sphincters.  
Pudendal nerve motor latency testing.  
Tests of defaecography including dynamic MRI of the pelvic floor.  
Capsule radio-opaque marker study of intestinal transit.

## Imaging the anal sphincters and the pelvic floor

### Learning objectives and essential core knowledge

Anatomy of the anal sphincters and the pelvic floor.  
Principles of anal ultrasound.  
Understand the principles, uses and limitations of colonic ultrasound.  
Types of transducers – linear vs. sector vs. rotating.  
Frequency of ultrasound transducers vs. focal length of image.  
Ultrasound anatomy of the anal sphincters.  
Magnetic resonance anatomy of the anal sphincters and the pelvic floor.  
Principles of magnetic resonance; T1 vs T2. Fat suppression, fat saturation. Use of gadolinium contrast.

The endorectal coil. Static vs. dynamic MR and the limitations of MR.  
Other types of contrast such as ultrasound gel

### **Clinical skills**

Indications for assessment of the anal sphincters and pelvic floor by anal ultrasound and by magnetic resonance imaging.

Be able to correlate digital exam findings with anal ultrasound images.

### **Procedure skills**

Prepare an individual for anal endosonography.

Position the patient for anal endosonography.

Orientation of anal ultrasound images with the individual in the left lateral and lithotomy position.

Identify the following; external anal sphincters, internal anal sphincter, inter-sphincteric plane with strip of longitudinal circular muscle, perineal body and the anal cushions.

Techniques of maintaining acoustic contact.

Normal ultrasound anatomy of the anal sphincters in Asians vs. white Caucasians.

Anal ultrasound for fistulas including image enhancement with hydrogen peroxide.

Interpretation of images of anal ultrasound in the following conditions;

Faecal incontinence.

Anal fistula.

Inter-sphincteric, ischio-anal and abscesses above the anococcygeal raphe.

Obstructed defaecation and internal sphincter hypertrophy.

Understand the principles, uses and limitations of colonic ultrasound.

Endorectal ultrasound for rectal cancer

Rectal ultrasound anatomy –the five layer model.

Recognize T0, T1, T2, T3 and T4 images.

Identify mesorectal fat and lymph nodes.

Know the limitations of lymph node assessment by endosonography.

Know the principles of and how to perform ultrasound guided biopsy.

CT and MR imaging of rectal cancer – Most of the learning guides follow the principles of ultrasound. In addition, you must be aware of the special ability of MR in detection of the mesorectal margin and be aware of the importance of measurement of the advancing edge of rectal tumor from the mesorectal margin. Also, be aware of how such imaging could guide the use of pre-operative chemoradiation for rectal cancer.

## **Imaging the large and small bowel**

### **Learning objectives and essential core knowledge**

Understand sagittal, coronal and cross sectional anatomy of the large and small bowel.

Barium contrast studies.

The role of Barium studies.

Small bowel imaging, including small bowel enteroclysis.

Indications for radionuclear imaging of the intestinal tract.

Limitations of each of these investigations.

CT Colonography – technique and image interpretation.

Understand the indications and limitations of CT and MR angiography.

The indications and limitations of therapeutic embolisation for GI bleeding.

The role of imaging liver secondaries in large bowel cancer, triphasic contrast and planning liver resection.

## **Colorectal cancer**

Surgical options for recurrent colorectal cancer

Reresection with sacrectomy and cystectomy with ileal conduit (in collaboration with urology).

## **Management of rare Malignancies**

**Paget's disease** – recognize the clinical appearance of perianal Paget's, biopsy technique under local anesthesia and the management of Paget's disease including surveillance.

**Anal melanoma** – etiology and presentation of melanoma of the anal canal. Be aware of amelanotic melanoma. Staging melanoma, the principles of surgical excision, the role of adjuvant therapy and the poor prognosis associated with late stage melanoma.

**Pre-sacral tumors** – sacral dermoid, chordoma, liposarcoma.

Focused history, examination, evaluation by anal ultrasound, MR and CT. Targeted biopsy,

## **Constipation and Obstructed Defecation**

Perform anorectal manometry and endoanal ultrasound

Perform and interpret images of defaecating proctography.

Understand the method of and interpret images of dynamic magnetic resonance imaging

Understand and interpret studies of colonic transit.

Perform colonoscopy and lavage in pseudo-colonic obstruction

Manual evacuation of faecal impaction

Use of warm oil retention enemas, technique.

Perform and supervise biofeedback for constipation

Subtotal versus segmental colectomy for slow transit, advantages and disadvantages.

Repair of a rectocele – trans-anal, trans-vaginal, perineal.

The STAAR procedure

Mesh fixation sacro-colpopexy – open and laparoscopic.

Botulinum injection for puborectalis paradox- dose, site, frequency, maximum dose.

## **Faecal incontinence**

Anal sphincteroplasty.

Pelvic floor repair

Neo-anal sphincter operations; biological and artificial sphincters.

Sacral nerve stimulation for faecal incontinence

Internal anal sphincter augmentation ; collagen, injection of microspheres.

Malone antegrade irrigation

Methods of biofeedback

**Advanced Laparoscopic procedures**

Procedures for Diverticulitis and complications

Minimal access surgery for complicated Crohn's disease

**NOTES**

Be familiar with the latest development in NOTES procedures

## **ENDOSCOPY TRAINING – ADVANCED MODULE**

Some of these techniques may not be available in this country at the moment. However trainees are encouraged to acquire procedures found in this module whenever there is an opportunity.

### **Core knowledge**

Design, function and capabilities of newer endoscopic techniques  
EUS anatomy

### **Clinical skills**

Appropriateness and correct indication  
Obtaining informed consent  
Patient preparation (including bowel preparation in lower GI procedures)  
Patient safety  
Safe administration of sedation and monitoring of the patient  
Patient aftercare  
Documentation  
Record keeping

### **Procedure skills**

#### **Upper GI Endoscopy**

Diagnostic Endoscopy

NBI / FICE

Autofluorescence Endoscopy

Magnifying endoscopy / Endomicroscopy

Interpretation of pit pattern (Kudo's classification)

Identification and classification of early upper GI malignancies

Optical Coherence Tomography (OCT)

Therapeutic Endoscopy

EMR

ESD

#### **Lower GI Endoscopy**

Diagnostic lower GI Endoscopy

NBI / FICE

Magnifying endoscopy / Endomicroscopy

Interpretation of pit pattern (Kodos classification)

Identification and classification of early lower GI malignancies

Therapeutic Endoscopy

EMR

ESD

#### **Enteroscopy of the small bowel**

Diagnostic

Double balloon enteroscopy

Single balloon enteroscopy

Therapeutic

Dilatation of small bowel strictures

**Endosonography (EUS)**

Diagnostic (upper GI, Lower GI and HBP)

Linear scan

Radial scan

EUS probe

Therapeutic

EUS guided FNA

Tent placement for cystic lesion of the pancreas

**Capsule Endoscopy**