CERTIFIED FELLOWSHIP IN GASTROENTEROLOGY AND HPB ONCOLOGY

[Syllabus Approved by Board of Studies, Medical & Health Sciences]

Programme Code	:	HLTH14A06
Programme Details	:	2-YEARS HBNI CERTIFIED FELLOWSHIP IN GASTROENTEROLOGY AND HPB ONCOLOGY
Programme Learning Outcomes (PLOs / PSOs)	:	MENTIONED [COMMON FOR ALL 2 YRS HBNI CERTIFIED FELLOWSHIPS OFFERED AT TMC]
Eligibility Criteria	:	MCH/DRNB IN SURGICAL GASTROENTEROLOGY OR SURGICAL ONCOLOGY OR MS (GENERAL SURGERY) WITH 1-YEAR EXPERIENCE IN GASTROINTESTINAL SURGERY.
Duration of the Course	:	2 YEARS
Programme Structure (Credit-Based)	:	NA
Detailed Course Syllabus	:	ATTACHED
Teaching–Learning Methodologies	:	2 YEARS PROGRAM
Examination & Evaluation System	:	ANNUAL APPRAISAL FOLLOWED BY UNIVERSITY FINAL EXAMINATION
Internship / Project / Dissertation Guidelines	:	NA
Program In Charge	:	PROF. MAHESH GOEL (***drmaheshgoel@gmail.com***)

CERTIFIED FELLOWSHIP (BREAST GASTROENTEROLOGY AND HPB ONCOLOGY)

Programme Code: HLTH14A06

Programme Outcome:

- The HBNI Fellowship Programmes at Tata Memorial Centre are designed to develop competent, ethical, and academically oriented healthcare professionals with advanced knowledge and skills in their respective specialties and subspecialties.
- At the completion of the fellowship, candidates are expected to demonstrate excellence in clinical practice, patient-centered care, multidisciplinary teamwork, communication, professionalism, and evidence-based decision-making.
- Fellows shall acquire the ability to independently evaluate, diagnose, plan, and manage patients while adhering to institutional protocols, quality standards, patient safety practices, and ethical principles in healthcare delivery.
- The fellowship programmes also aim to foster academic growth, research aptitude, lifelong learning, and leadership qualities among trainees.
- Fellows are expected to actively participate in teaching, seminars, journal clubs, conferences, audits, and research activities, thereby contributing to the advancement of medical science and institutional development.
- Upon successful completion of the programme, the fellow should be capable of functioning independently as a skilled specialist/subspecialist with competence in clinical services, academics, research, and collaborative healthcare practice in tertiary care and oncology-focused settings.

DETAILED SYLLABUS

Goal of the fellowship

- To provide comprehensive, multidisciplinary training to individuals committed to a career in HPB & UGI surgical oncology.

Program outcome

- A student pursuing HBNI Fellowship in HPB & UGI SURGERY course will acquire adequate knowledge at least in the following aspects
  - Basic Sciences as applied to HPB & UGI system –Anatomy, Development and Physiology
  - Clinical, experimental, comparative, investigative, surgical, and applied aspects of disease of HPB & UGI system and serve their region, state, and country in a cost-effective manner
  - Recent advances and minimally invasive (laparoscopic & robotic) procedures in the Management of HPB & UGI cancers and other HPB & UGI disorders/diseases for the progress of the specialty and practice up to dated skill and knowledge.

Eligibility Requirements

- Candidates who have completed MS/DNB in General Surgery along with at least 2 years' experience in HPB or Gastrointestinal surgery or M.Ch./DNB in Surgical Oncology/Surgical Gastroenterology

Subject Specific Learning Objectives

- Knowledge in the basic, comparative, translational, and clinical aspects of HPB & UGI diseases to understand the disease burden, distribution, determinants in the region and country.
- Clinical, diagnostic, critical thinking, problem solving, self-directed learning and Surgical procedural skills required in treatment of HPB & UGI cancers.
- Skills as related to formulating research questions, initiating, conducting, and analyzing translational, clinical, surgical, and epidemiologic research. The Fellows shall focus on research oriented toward ease of access, lower the cost of treatment, novel treatment, of commonly encountered HPB & UGI diseases.

- Team leadership and networking skills to train the medical and paramedical fraternity in the state, country, and region about the common HPB & UGI cancers.
- Communication skills necessary for counselling and educating patients and team members at local, national, regional, and internal forum.
- Attitudes and values that will allow him or her to provide compassionate, responsive, and respectful ethical care to the patient.

Theoretical Knowledge:

- The Fellow will acquire knowledge in all aspects relevant to the practice of common HPB & UGI cancers in the state, country, and region. This includes training and expertise in HPB & UGI surgery capable of providing specialist care to our citizens, being a teacher and guiding researcher in HPB & UGI surgery, to promote the research in the state, region and the country.
- She/ He will acquire and be able to impart necessary knowledge, skill, and attitudes to diagnose and manage in a cost-effective manner to solve various clinical problems commonly seen in the local community and at secondary and tertiary care centers of the region and country. Special emphasis should be placed on HPB & UGI cancer screening programs to reduce the disease burden in the region.

Surgical Skills

- The Fellow will acquire surgical expertise in all aspects relevant to the practice of common HPB & UGI cancers, including retroperitoneal and small intestinal tumors.

Technical Skills

- The Fellow will be able to teach relevant aspects of HPB & UGI cancers to resident doctors, junior colleagues, nursing and para-medical staff to enhance the skilled work force at local level.

Research Methodology

- Fellow will be able to identify and investigate a research problem, prevailing in the local community or state or country, using appropriate methodology.

Group Approach

- Fellow will participate in multi-disciplinary meetings with experts in HPB & UGI Surgical Oncology, Radiology, Pathology, Oncology, Laboratory Medicine, and other allied clinical disciplines. This will help them to integrate acquired knowledge and apply them aptly

SUBJECT SPECIFIC COMPETENCIES

At the end of the course, the Fellow will acquire the following competencies under the three domains:

A. Cognitive domain (Knowledge domain)

By the end of the course, the Fellow will be able to:

- Demonstrate that he/she is well versed with the past and current literature on relevant aspects of basic, preventive, investigative, clinical, surgical, and interventional procedures. They shall also be capable and well versed to diagnose and manage HPB & UGI cancer patients.
- Demonstrate a thorough knowledge of epidemiology of HPB & UGI cancers which are prevalent at local, regional, state, and country level; natural history, pathological abnormalities, etiopathogenesis, clinical manifestations and principles of management of common HPB & UGI cancers such as hepatocellular carcinoma (HCC), colorectal liver metastases (CRLM), pancreatic cancers, gallbladder cancers, stomach cancers etc.
- Plan appropriate investigations applicable for diagnosis and management in a cost-effective manner and interpret correctly the results of various routine and specialized investigations necessary for proper management of the patients with HPB & UGI diseases. They shall be able to judicially prioritize their investigation and treatment to meet the resource limitations of the state or country.
- Recognize and manage HPB & UGI malignancies, both rare and common, in particular those which are prevalent in the local setting.
- Be able to plan and conduct a research proposal in the specialty in accordance with guidelines of Ethics Committee and critically evaluate published literature in medical journal. Research shall be focused on local, regional, and national health priorities.
- Acquire relevant knowledge of biostatistics to be able to critically read and judge new literature and interpret its application in the context of the country
- Recognize the value of ethical principles of patient care and research, particularly in context of Indian values and beliefs.

- Be able to take decisions regarding hospitalization or timely referral to other consultants of

various specialties recognizing his/her limitations in these areas. This will help the country in efficient use of scare health care resources.

- Have a basic knowledge of data science as it applies to HPB & UGI disorders - including artificial intelligence machine learning devices and wearables.

B. Affective domain, i.e., attitudes including communication and professionalism (course outcome)

The Fellow Should:

- Have empathy for patients and their family members
- Discuss options, including advantages and disadvantages of each investigation and treatment. She/He should be able to discuss medical and surgical issues with them in local, regional or national language using non-scientific terms.
- Become confident communicators and should be well accomplished professionals who could serve for the betterment of its country and advancement of science.
- Have developed skills to debate, deliver scientific lecture, participate in panel discussions, and hold group discussions and be ready to deliver the knowledge received by him/her during the course. Such skill will elevate the status of the region or country on national or international forum.
- Be able to function as a part of a team, develop an attitude of cooperation with colleagues, and interact with the patient and the clinician or other colleagues to provide the best possible diagnosis or opinion. They shall have attitude to share their knowledge and skill with medical fraternity serving in resource limited setting of the country
- To abide with the laws of the country, always adopt ethical principles and maintain proper etiquette in dealing with patients, relatives and other health personnel and to respect the rights of the patient including the right to information and second opinion
- Develop communication skills to write reports and give professional opinion as well as to interact with patients, relatives, peers and paramedical staff, and for effective teaching.

C. Affective Psychomotor domain

At the end of the course, the Fellow will have acquired following skills

- The Fellow should be able to perform independently the following procedures and/ or interpret the results of:
  - Will be able to perform:
    - Tumor Mapping
    - Pancreatic surgeries – Whipple's procedure, distal pancreatosplenectomy, RAMPS
    - Gallbladder surgeries – Simple and radical/revision cholecystectomies
    - Liver surgeries– Major and minor liver resections
    - Stomach surgeries – Subtotal and total gastrectomies
    - Retroperitoneal tumour surgeries
    - Complex biliary surgeries
  - Will be able to interpret:
    - Radiologic studies for diagnosis and treatment of HPB & UGI diseases including: Plain X-ray/ USG, CT scan/MRI
      Radionuclide imaging including PET scan
    - Ancillary tests: like genetic counseling and basic molecular genetic tests applicable to HPB & UGI Cancers.
- The Fellow will be able to observe or perform under supervision the following procedures – desirable skills
  - Fine needle aspiration cytology
  - Abdominal ultrasound
  - IOUS – Intraoperative ultrasound

The Liver

- **Anatomy, Embryology, Physiology, Investigations**
  - **Objectives**: Upon completion of term, the fellow will understand:
    - Intrahepatic and extrahepatic anatomy of the liver and the relationship with
    - the adjacent and surrounding structures
    - The embryology of the liver and biliary tract and the potential anomalies
    - The physiology of the liver
    - Clinical hematologic and biochemical tests relevant to the liver and their indications and interpretation: Tests of hepatocellular injury & Tests of liver function
    - Hepatic imaging techniques and their indications and interpretation
    - Implications of investigations and surgical procedures on the liver

  - **Content**:
    - Embryology of the liver - Relationship to other foregut structures
    - Extrahepatic anatomy of the liver
      - Lobes, sectors, segments
      - Nomenclature systems
      - Ligaments, fissures and incisures
      - Anomalies

    - Anatomy of the porta
      - Portal vein, hepatic artery
      - Bile duct, gall bladder
      - Variants of normal and anomalies
      - Lymphatic drainage and nodal anatomy
      - Nerves

    - Anatomy of the retrohepatic space
      - IVC and its branches
      - Adrenal, kidney, diaphragm

    - Intrahepatic anatomy:
      - Hepatic veins and variants of normal
      - Portal triad structures and segmental anatomy
      - Histology of the normal liver

- Physiology of the liver
    - Bilirubin metabolism
    - Coagulation
    - Other clinically relevant metabolic pathways

- Hematologic, biochemical, and histologic testing (assessment) of the liver
    - Transaminases and markers of cholestasis
    - Measures of liver function –
      Static – including INR (PT), Factors V and VII, bilirubin, albumin
      Dynamic – including clearance tests , e.g. ICG, galactose, aminopyrine, lidocaine (MEGX)
    - Indicators of portal hypertension
    - Indications for liver biopsy

- Imaging of the liver
    - Ultrasound (U/S) and Doppler, Computerized Tomography (CT) Scans, Magnetic Resonance Imaging (MRI) Scans
    - Nuclear tests: Proton Emission Tomographic (PET) Scans, Liver/Spleen scans, Biliary excretion (e.g. HIDA) Scans, RBC Scans

- Application of investigations to hepatic surgery

- **Clinical Skills**:
    - Identify, recognize, and describe anatomic structures in and around the liver - By reading and interpreting images of the liver & Intraoperatively
    - Perform and interpret intraoperative U/S of the liver and porta
    - Perform liver biopsy – percutaneously, laparoscopic or open
    - Identify anatomic anomalies and explain their embryologic origin
    - Understand the indications for and be able to interpret the hematologic and biochemical tests and explain the underlying physiology
    - Interpret the dynamic tests of liver function
    - Apply the relative advantages and disadvantages to the application of the different modalities of hepatic imaging
    - Determine the appropriate abdominal wall incisions for open procedures on the liver

- Determine the appropriate port site placements and patient positions for laparoscopic procedures on the liver, and the relative indications for each and the need for a hand-port
- Evaluate liver function and portal hypertension (including Child's score and its variations)
- Assess the overall risk and the hepatic risk of surgery by recognizing the implications of abnormalities of liver hematologic and biochemical testing on both hepatic and non-hepatic procedures.
- Develop a detailed operative strategy for liver resections based on preoperative assessment and imaging

- **Neoplastic Liver Disease**
  - Objectives: Upon completion of this unit the fellow will understand:
    - The pathophysiology, presentation and natural history of benign, primary and secondary malignant neoplasms of the liver.
    - The investigative procedures available to efficiently diagnose the disease/disorder.
    - The staging of malignancies of the liver including histologic assessment
    - The treatment options available for the neoplasm, and the results, including the risks and benefits of the operative and non-operative procedures.
    - The pre, intra- and postoperative management, including the management of complications of therapy.
    - The role of neoadjuvant and adjuvant therapy of malignant liver neoplasms.

- **Content:**
  - Benign neoplasms of the liver
    - Presentation, investigation, diagnosis, and natural history of hemangioma, hamartoma, adenoma, focal nodular hyperplasia
    - Histology and indications for biopsy
    - Treatment options and indication for ablation or resection

  - Primary malignancies of the liver

    Hepatocellular carcinoma (HCC)

    - Etiology, presentation, investigation, diagnosis, and natural history of HCC
    - Role of screening and staging systems for HCC
    - Treatment options and the risk: benefit ratio for each: resection, transplantation, ablation, chemotherapy +/- embolization, radiation

Cholangiocarcinoma (intrahepatic or peripheral)

- Diagnosis, investigation and staging
- Treatment options including palliative procedures

Epithelioid hemangioendothelioma, lymphoma, sarcoma and other neoplasms

- Diagnosis, investigation and staging
- Treatment options

- Secondary malignancies of the liver

Colorectal primary

- Pathogenesis, staging of colorectal cancer
- Investigation and staging
- Treatment options
  Indications, and risk: benefit ratio of ablation / resection
  Neo-adjuvant, downstaging, and adjuvant chemotherapy

Neuroendocrine and other primary

- Investigation and staging
- Treatment options
- Indications, and risk: benefit ratio ablation / resection
- Neoadjuvant and adjuvant therapy

- **Clinical Skills:**
  - Evaluate patients with benign neoplasms of the liver, including interpretation of imaging and indications for biopsy
  - Manage patients with benign hepatic neoplasms
  - Evaluate patients with HCC, including screening for potential HCC and staging
  - Evaluate patients with primary and secondary adenocarcinoma and other metastatic lesions of the liver including staging
  - Manage patents with primary and secondary hepatic malignancies
  - Participate in multidisciplinary tumor review conferences
  - Perform liver resections
  - Provide pre- and postoperative therapy following liver resection including the diagnosis and management of complications

- Recommend appropriate therapy for unresectable hepatic malignancies
- Recommend appropriate adjuvant radiation and/or chemotherapy following resection for hepatic malignancies
- Interact with Medical and Radiation Oncologists

- **Liver Surgery:**
  - **Objectives**: Upon completion of this unit the fellow will understand:
    - The types of and techniques for liver resections
    - Preoperative patient assessment and the cumulative risks of the proposed procedure
    - Preoperative management
    - Intraoperative management during a liver resection
    - Postoperative management including complications.

  - **Content**:

    Types of liver resection
    - Nomenclature of liver resections (Brisbane system)
    - Laparoscopic, laparoscopic-assisted, open laparotomy
    - Nonanatomic, segmental, lobectomy, extended lobectomy
    - Vascular control: none, Pringle maneuver, total vascular isolation (5) Vascular resection and reconstruction
    - Staged resections
    - Combination with ablation

    Preoperative assessment and the cumulative risks to the proposed procedure
    - Patient comorbidities (cardiopulmonary and other)
    - Hepatic risk
    - Assessment of liver function, portal hypertension
    - Volumetric assessment of liver remnant
    - Portal vein embolization

    Preoperative management
    - Prophylaxis against common complications , DVT, infection
    - Neuroendocrine hormonal blockade
    - Detailed operative plan based on preoperative imaging

Liver resection

- Anesthetic considerations - Agents, coagulation, CVP
- Blood loss conservation including cell saver and blood product administration
- Laparoscopic techniques - Patient and port placement & Hand port
- Parenchymal transection techniques -
  Relative advantages and disadvantages
  Normal, fatty, fibrotic and cirrhotic parenchyma
  Laparoscopic or open use
- Concomitant resection and reconstruction of the
  Diaphragm
  IVC
  Portal vein
  Bile duct
- Postoperative management - Complications and management, including liver failure

- **Clinical Skills**:

Types of liver resection

- Evaluate patients for liver surgery including the comorbidities and any underlying liver disease to determine risk
- Determine the need for portal vein embolization, staged resection or concomitant ablation
- Perform intraoperative staging of tumors including intraoperative U/S
- Perform liver resections using a variety of approaches and transection techniques
- Perform complex liver resections including bile duct, portal vein, IVC, diaphragm
- Manage the liver resection patient during the immediate, early and late post-operative periods and diagnose and treat complications of the resection

The Biliary Tract including Gallbladder

- **Anatomy, Embryology, Physiology, Testing**
  - **Objectives**: Upon completion of this unit the fellow will understand:
    The anatomy of the biliary tract including the intra- and extrahepatic, hepatic duct, the gallbladder and cystic duct, the common bile duct, the ampulla of Vater, and their relationships with the adjacent and surrounding structures
  - The embryology of the liver and biliary tract and the potential anomalies
  - The physiology of bile metabolism and biliary tract epithelium

- Clinical biochemical tests relevant to the biliary tract and their interpretation
- Biliary imaging techniques and their indications and interpretation
- Implications of investigations on surgical procedures on the bile duct

- **Content**:

Embryology of the biliary tract

- Relationship to liver, pancreas and other portal and foregut structures

Anatomy of the hepatic duct and biliary plate

- Segmental anatomy and variants of normal
- Blood supply and lymphatic drainage
- Relationship with other portal structures

Anatomy of the gallbladder and cystic duct

- Blood supply and lymphatic drainage
- Variants of normal and anomalies

Anatomy of the bile duct

- Blood supply, lymphatic drainage and regional lymph nodes
- Variants of normal and anomalies
- Relationship with other portal structures and the pancreatic duct
- Sphincter of Oddi and ampulla of Water

Bile metabolism and biliary physiology

- Bile-salt dependent and independent bile production
- Hormonal influences
- Biliary epithelium and gallbladder function
- Sphincter of Oddi motility

Biochemical investigation

- Interpretation

Imaging

- Axial and body imaging techniques
- U/S, CT scan and MRI scan, including MRCP

Endoscopic ultrasound

Direct contrast imaging

- Percutaneous transhepatic cholangiogram (PTC) and cholecystography and endoscopic retrograde cholangiopancreatography (ERCP)

Endoscopic assessment of Ampulla of Vater
Nuclear biliary excretion imaging (HIDA scan) – qualitative and quantitative (HIDA scan)

- **Clinical Skills:**
  - Identify and describe biliary tract structures (normal and abnormal)
    By reading and interpreting images of the biliary tract
    Intraoperatively
  - Perform and interpret intraoperative U/S of the liver and biliary tract
  - Identify anatomic anomalies and explain their embryologic origin
  - Understand the indications for and be able to interpret the biochemical tests and explain the underlying physiology
  - Apply understanding of the relative advantages and disadvantages of the different modalities of biliary tract imaging to determine optimal investigation
  - Determine the abdominal wall incisions that are appropriate for open procedures on the biliary tract and the relative indications for each
  - Determine the appropriate port site placements and patient positions that are useful for laparoscopic procedures on the biliary tract and the relative indications for each
  - Develop a detailed operative strategy for biliary surgery based on preoperative assessment and imaging

Neoplastic Biliary Disease

- **Objectives**: Upon completion of this unit the fellow will understand:
  - The presentation and natural history of benign and malignant neoplasms of the bile duct and gallbladder
  - The investigative procedures available to efficiently diagnosis the neoplasm.
  - The staging of adenocarcinoma of the bile duct and gallbladder including histologic assessment
  - The treatment options available for the neoplasm, and the indications and outcomes, including the risks and benefits of the operative and non-operative treatments
  - The pre-, intra- and postoperative management, including the management of complications of surgery.
  - The role of neoadjuvant and adjuvant chemo- and radiation therapy of malignant biliary neoplasms

- **Content**

Gallbladder

- Polyps
  Presentation, natural history
  Indications for resection
  Principles of resection

- Adenocarcinoma
  Presentation, staging (including histology) and natural history
  Investigation
  Surgical options - Extent and timing of resection
  Chemo and radiotherapy - Neo- and/or adjuvant therapy & Definitive management
  Palliative care options

Bile Duct

- Adenoma of Ampulla of Vater
  Presentation, natural history, investigation
  Resection options - Endoscopic, transduodenal resection and reconstruction

- Adenocarcinoma
  Location: Hilar (Klatskin), intrapancreatic, ampulla
  Type – papillary, sclerosing
  Presentation, investigation and staging, including laparoscopic staging
  Resection and reconstruction – indications and
  Contraindication
  Palliative options - PTBD or endoscopic stent & Surgical bypass

- **Clinical Skills:**

- Investigate and manage patients with gallbladder polyps and benign neoplasms of the ampulla of Vater -
  Perform extended cholecystectomy for potential oncologic indication
  Perform transduodenal resection of the Ampulla of Vater with reconstruction of the bile and pancreatic ducts.
- Investigate and manage patients with hilar cholangiocarcinoma - Perform extended resection of the biliary bifurcation with the caudate and ipsilateral lobes of the liver, portal lymphadenectomy, and biliary reconstruction
- Investigate and manage patients with distal bile duct tumors (1) Perform pancreatoduodenectomy
- Participate in multidisciplinary tumor review conferences
- Provide postoperative management including the diagnosis and treatment of complications of biliary resection and/or bypass

- Recommend appropriate adjuvant radiation and/or chemotherapy following resection and interacts with Medical and Radiation Oncologists
- Recommend appropriate therapy for unresectable carcinoma of the gall-bladder or bile duct

The Pancreas, Stomach & Duodenum

- **Anatomy, Embryology, Physiology, Testing**
  - **Objectives**: Upon completion of this unit the fellow will understand:

    Anatomy of pancreas and its relationship with portal structures, retroperitoneal structures and the adjacent organs.
  - Anatomy of the pancreatic duct and its relationship with the bile duct, sphincter of Oddi and the ampulla of Vater
  - Anatomy of duodenum and its relationship with portal structures, retroperitoneal structures and the adjacent organs
  - The embryology of the pancreas, pancreatic duct and duodenum and potential anomalies
  - The physiology of pancreatic exocrine and exocrine functions and duodenal physiology
  - Clinical biochemical tests of pancreatic function and injury and their interpretation
  - Pancreatic and duodenal imaging techniques and their indications and interpretation
  - Implications of investigations on surgical procedures on the pancreas and duodenum

  - **Content:**

    Embryology of the pancreas and duodenum
    - Relationship to liver, bile duct and other foregut structures
    - Etiology of anomalies including pancreas divisum and annular pancreas

    Anatomy of the pancreas
    - Spectrum of normal anatomy and variants
    - Arterial supply and venous drainage
    - Lymphatic drainage and regional lymph nodes.
    - Relationship with: (a) Portal structures: duodenum, bile duct, hepatic artery, portal vein, splenic and superior mesenteric veins and their branches

(b) Retroperitoneum: IVC and its branches, aorta and SMA and their branches, adrenal gland, kidneys (c) Adjacent organs: stomach, spleen, colon, small intestine

- Anatomy of the pancreatic duct - (1) Variants of normal and anomalies
- Anatomy of the stomach & duodenum (1) Spectrum of normal anatomy and variants (2) Arterial supply and venous drainage

(3) Lymphatic drainage and regional lymph nodes. (4) Relationship with: Portal structures: bile duct, hepatic artery, portal vein, splenic and superior mesenteric veins and their branches.

Retroperitoneum: IVC and its branches, aorta and SMA and their branches, adrenal gland, kidneys

Adjacent organs: pancreas, stomach, spleen, colon, small intestine

Pancreatic metabolism and physiology

- Exocrine enzyme physiology (a) Synthesis, excretion and activation (b) Neural and hormonal influences
- Endocrine metabolism (a) Islet cell function, neuroendocrine hormones

Stomach & Duodenal physiology

- Motility
- Neuroendocrine ("gut") hormone physiology
- Biochemical investigation and interpretation

Biochemical Testing

- Markers of pancreatic injury
- Measures of pancreatic exocrine function
- Urinary and serum neuroendocrine hormones

Imaging

- Axial and body imaging techniques: U/S, CT scan and MRI scan, including MRCP
- Endoscopy and endoscopic U/S
- Direct contrast imaging - Endoscopic retrograde cholangio-pancraetography (ERCP)
- Nuclear studies: (a) PET scan (b) Neuroendocrine imaging (Octreotide scan)
- Application of testing and imaging to pancreatic and duodenal surgery

- **Clinical Skills:**
  - Identify, recognize, and describe anatomic structures in and around the pancreas, stomach & duodenum (1) By reading and interpreting images of the stomach, duodenum, pancreas and its duct (2) Intraoperatively

- Perform and interpret intraoperative U/S of the pancreas and surrounding structures
- Identify anatomic anomalies and explains their embryologic origin
- Understand the indications for and interpret the biochemical tests and explain the underlying physiology including the tests of pancreatic function
- Apply the relative advantages and disadvantages of the different modalities of pancreatic imaging to efficiently investigate diseases and disorders of the pancreas and duodenum
- Determine the appropriate abdominal wall incision for open procedures on the pancreas, stomach and/or duodenum
- Determine the appropriate port site placements and patient positions for laparoscopic procedures on the pancreas, stomach and/or duodenum and the relative indications for each and the need for a hand-port
- Develop a detailed operative strategy for pancreatic and duodenal surgery based on preoperative assessment and imaging

- **Neoplastic Diseases of the Pancreas**
  - **Objectives:** Upon completion of this unit the fellow will understand: The Pathophysiology, presentation and natural history of benign, primary and secondary malignant neoplasms of the pancreas
  - The investigative procedures available to efficiently diagnose the disease/disorder
  - The staging of malignancies of the pancreas including histologic assessment
  - The treatment options available for the neoplasm, and the outcomes, including the risks and benefits of the operative and nonoperative procedures
  - The pre-, intra- and postoperative management, including the management of complications of therapy
  - The role of neoadjuvant and adjuvant therapy of malignant pancreatic lesions

  - **Content:**

Benign cysts and neoplasms of the pancreas

Microcystic serous cystadenoma

- Presentation, investigation, diagnosis, and natural history
- Histology and indications for biopsy
- Treatment options and indication for resection

Mucinous cystic neoplasm

- Presentation, investigation, diagnosis, and natural history
- Histology and indications for aspiration/biopsy
- Treatment options and indication for resection

Intraductal papillary mucinous neoplasm (IPMN)

- Presentation, investigation, diagnosis, and natural history
- Histology and indications for aspiration / biopsy
- Treatment options and indication for resection

Solid Pseudopapillary Neoplasms

- Presentation, investigation, diagnosis, and natural history
- Histology and indications for aspiration / biopsy
- Treatment options and indication for resection

Cystic Neuroendocrine Tumors

- Presentation, investigation, diagnosis, and natural history
- Histology and indications for aspiration / biopsy
- Treatment options and indication for resection

Von Hippel Lindau syndrome

- Pathology, associated lesions, investigation
- Management

Malignancies of the pancreas

Primary

- Adenocarcinoma
  Presentation, investigation and staging
  Assessment of resectability
  Pre-, peri- and postoperative management
  Palliative procedures

- Neuroendocrine tumors
  Presentation, investigation and staging
  Assessment of resectability
  Pre-, peri- and postoperative management

- Lymphoma
  Presentation, staging
  Role of surgery

- Secondary
  Renal cell carcinoma - Presentation and management
  Melanoma - Presentation and management

- **Clinical Skills:**

  Investigate and manage patients with benign cysts and neoplasms of the pancreas

  - Determine need for biopsy/aspiration and resection
  - Perform resections including enucleation of NE tumors and spleen preserving distal pancreatectomy

  Investigate and manage patients with adenocarcinoma of the pancreas

  - Stage the tumor pre- and intraoperatively and determine resectability
  - Perform pancreatoduodenectomy +/- portal vein resection and reconstruction
  - Perform distal pancreatectomy and regional lymphadenectomy
  - Perform palliative procedures for unresectable tumors

  Participate in multidisciplinary tumor review conferences.

  Provide postoperative management including the diagnosis and treatment of complications of pancreatic resection and/or bypass.

  Recommend appropriate therapy for unresectable pancreatic carcinoma.

  Recommend appropriate neo- and adjuvant radiation and/or chemotherapy and interact with Medical and Radiation Oncologists.

- **Diseases of the Stomach & Duodenum**

  - **Objectives**: Upon completion of this unit the fellow will understand:The pathophysiology, presentation and natural history of the diseases of the pancreas
  - The investigative procedures available to efficiently diagnose the disease/disorder
  - The treatment options available for the condition, and the results, including the risks and benefits of the operative and non-operative procedures
  - The pre-, intra- and postoperative management, including the management of complications of therapy

- **Content:**

Malignant neoplasms of the stomach & duodenum

Adenocarcinoma

- Presentation, investigation, staging
- Management

Gastrointestinal stromal tumor (GIST) and sarcomas

- Presentation, investigation, staging
- Management options - Chemotherapy & Resection

Neuroendocrine tumor

- Presentation (syndromes) investigation, staging
- Management

"Secondary" to direct invasion of adjacent malignancy

- Carcinoma of the stomach or colon
- Renal cell carcinoma
- Investigation, staging
- Operative management

- **Clinical Skills:**

Investigate and manage patients with benign lesions of the of the duodenum

- Determine need for operative intervention
- Perform acid-reduction procedures, limited resection and duodenal bypass procedures

Investigate and manage patients with malignant neoplasms of the duodenum

- Stage the tumor pre- and intraoperatively and determine resectability
- Perform appropriate resection (including pancreatoduodenectomy +/- portal vein resection and reconstruction when necessary) with regional lymphadenectomy
- Perform palliative procedures for unresectable tumors
- Participate in multidisciplinary tumor review conferences
- Recommend appropriate therapy for unresectable duodenal malignancies
- Recommend appropriate neo- and adjuvant radiation and/or chemo-therapy and interact with Medical and Radiation Oncologists

Provide postoperative management including the diagnosis and treatment of complications of duodenal resection and/or bypass

Training Outline

- **Outline training schedule:**
  - **First Six months:**
    - Fellow will attend a minimum of Minor OT - 12 sessions - under supervision
    - OPD - 24 sessions
    - Major OT - Will assist for first three months, in next 3 months, will perform in major OT (assisted by a senior)

      Subtotal/total gastrectomy – 3
      Radical cholecystectomy – 3
      Distal pancreatectomy – 3
      Pancreaticoduodenectomy – 3
      Liver resections - 2

    - Will assist seniors in other cases and will maintain a log book which will be reviewed every month.
    - Fellow will maintain the databases of operated patients

  - **Second Six months:**
    - Fellow will attend a minimum of Minor OT - 12 sessions
    - Will assist in major HPB and UGI surgeries
    - OPD -Will work-up patients and present at a joint clinic.
    - Attend OPD with Medical Oncology consultant
    - Attend OPD with Radiation Oncology to learn planning and simulation.
    - In Major OT - will independently perform a minimum of (under supervision):

      Subtotal/total gastrectomy – 6 to 8 cases
      Radical cholecystectomy – 4 to 6 cases
      Distal pancreatectomy – 3
      Pancreaticoduodenectomy – 2
      Minor Liver resections - 3

- **Final months:**
  - Major OT: Will independently perform subtotal/total gastrectomy (atleast 8) pancreaticoduodenectomy (at least 7), distal pancreatectomy (atleast 5), radical cholecystectomy (atleast 5), minor liver resections (atleast 5), major liver resections (atleast 2) and all minor procedures in minor OT. Will be able to perform laparoscopic gastrectomies and radical cholecystectomies under guidance.
  - Also assist the reconstructive and vascular surgeons in venous and arterial reconstructions. Will get acquainted with all minimal access HPB & UGI surgeries (laparoscopic and robotic).
  - Out Patient Department (OPD): Will work-up patients and present at the joint clinics (held 4 times in a week, 3 being multi-disciplinary)

Teaching And Learning Methods

- **General principles**

  Acquisition of practical competencies being the keystone of fellowship medical education, fellowship training should be skills oriented. Learning in fellowship program should be essentially self-directed and primarily emanating from clinical and academic work. The formal sessions are merely meant to supplement this core effort**.**

- **Training Program**
  - Multidisciplinary management of HPB & UGI cancers and evidence-based guidelines
  - Appropriate stage-wise surgical management of HPB & UGI cancers including Minimally Invasive surgery
  - Adjuvant systemic therapy and radiotherapy techniques
  - Vascular reconstruction techniques in HPB surgery
  - Clinical research methodology and its practical application HPB & UGI cancer research
  - Basic Research Training: Introduction in concepts of basic laboratory research in HPB & UGI cancer
  - Management of metastatic HPB & UGI cancers
  - Supervised hands-on training in major and minor surgeries with maintenance of log book records

- Rotational posting in all related specialties in Radiotherapy, Radiology, Medical Oncology, and Preventive Oncology.
- Palliative care and end-stage management of terminal patients

- **Teaching Methodology**

The Fellow should be given the responsibility of managing and caring for patients in a gradual manner under supervision.

- **Formal teaching sessions**

This should include regular bedside case presentations and demonstrations, didactic lectures, seminars, journal clubs, clinical meetings, and combined conferences with allied departments.

This will comprise of the following: **Minimum sessions**

- Bedside rounds - Five days per week
- Seminar - once in 8 weeks
- Journal club - once in two weeks
- HPB & UGI MDT Tumor Board Discussion- Three days per week
- Pathology – HPB & UGI Surgery meet - once in 4 weeks
- HPB & UGI - radiology meet - once in 8 weeks
- HPB & UGI - Nuclear Medicine conference -once in 8 weeks
- Clinical case discussion - once a week
- Outpatient clinic - thrice a week
- Mortality meeting - once a month
- Combined Grand rounds/ a Clinical meetings/CPCs (at Institution level) - once
- Fellow project presentation - once in 6 months

All above may refer to sessions conducted in given Department and not for each trainee.

- **Didactic Lectures**

In addition, 10 lectures per year covering recent advances in all aspects of HPB & UGI diseases would be taken by faculty. All Fellows will be required to attend these lectures as well and short term basic and clinical courses on:

- Bio-statistics
- Research methodology and relevant experimental lab medicine
- Use of computers in medicine
- Bioethics, ethical issues in practice

In addition, Fellow should attend accredited scientific meetings (CME, symposia, and conferences) once or twice a year.

- Additional sessions on Research methodology, use of computers in Medicine, Biostatistics, ethical and legal issues in practice, teaching methodology, hospital waste management, health economics, are suggested.
- Participation in the Community outreach/ Awareness programs by the Fellow is desirable.

- **Research Program**
  - HBNI Fellow will be required to participate in ongoing research projects in the field of HPB & UGI surgery under the guidance of the faculty. He/she will be encouraged to submit a research plan within 6 weeks after joining the course and prepare 1 original paper for publication/ready for sending to a journal for publication. In addition, the HBNI Fellow will participate in various departmental research activities.
  - Every HBNI Fellow will need to work on one clinical (audit/research project) and one translational research topic.
  - A HBNI Fellow would be required to present one poster presentation or read one paper at a national/state conference; should write a research paper from his/her work which should be published/accepted for publication/sent for publication during the period of his postgraduate studies
  - Log Book: During the training period, the HBNI Fellow should maintain a Log Book indicating the duration of the postings/work done in Wards, OPDs, OTs and Casualty. This should indicate the procedures assisted and performed, and the teaching sessions attended. The purpose of the Log Book is to:
    - Help maintain a record of the work done during training,
    - Enable Consultants to have direct information about the work; intervene, if necessary.
    - Use it to assess the experience gained periodically.

- The Log Book should be used to aid the internal evaluation of the Fellow. The Log book shall be checked and assessed periodically by the faculty members imparting the training. It should be signed by the Head of the Department. A proficiency certificate from the Head of Department regarding the clinical competence and skillful performance of procedures by the Fellow will be necessary before he/she would be allowed to appear in the examination.
- The Fellow will be encouraged to participate in the e-learning activities of the Department.

References

Book:

1.Title: Cancer Principles and Practice of Oncology, 11th Ed
Editor: DeVita, Hellman and Rosenberg
Author: DeVita, Lawrence and Rosenberg
Year: 2019
Publisher: LWW

2.Title: Mastery of Surgery, 7th Edition
Editor: Josef E. Fischer
Author: E. Christopher Ellison
Year: 2018
Publisher: Wolters Kluwe

3.**Title:** Shackelford's Surgery of the Alimentary Tract, 8th Edition
Editor: Charles J. Yeo
Author: Steven D. Meester
Year of Publication: 2018
Publisher: Elsevier

4.Title: Blumgart's Surgery of the Liver, Biliary Tract and the Pancreas, 7th Edition
Editor: William R. Jarnagin
Author: Allen, Chapman
Year of Publication: 2022
Publisher: Elsevier

5.Title: Principles of Surgery, 11th Ed

Editor: Schwartz

Author: Charles Brunicardi

Year of Publication: 2019

Publisher: McGraw Hill

6.Title: Short Practice of Surgery

Editor: Bailey and Love

Author: Ronan O'Connell

Year of Publication: 2023

Publisher: CRC Press

7.Title: Textbook of Surgery, 2nd Ed

Editor: Sabiston

Author: Townsend

Year of Publication: 2022

Publisher: Elsevier

Journals:

1. Journal of Clinical Oncology – ASCO (LWW)
2. Surgical oncology clinics of North America – Elsevier
3. JAMA oncology – AMA
4. Annals of Surgery
5. HPB
6. Journal of Surgical Oncology
7. Surgical Oncology
8. Journal of Gastrointestinal surgery
9. Annals of Surgical Oncology
10. European Journal of Surgical Oncology
11. World Journal of Surgery – Springer
12. World journal of Surgical Oncology – BMC
13. Indian journal of Surgery – Springer
14. Indian journal of Surgical Oncology – Springer
15. British Journal of Surgery – Oxford Academic

16. New England Journal of Medicine (NEJM)
17. Journal of National Cancer Institute (JNCI)
18. Lancet Oncology
19. The Lancet
20. Cancer
21. BMJ
22. British Journal of Cancer

APPENDIX – A

Requirements for HBNI Fellowship in HPB & UGI Surgery

Recommended Minimal Operative Experience

Operation	**Performed**	**Assisted**
Radical/Revision cholecystectomies	15	40
Pancreaticoduodenectomies (Whipple's procedure)	15	30
Major liver resections	03	20
Distal Pancreaticosplenectomy	05	15
Subtotal/total gastrectomy	10	50
Minor liver resections	05	10
Retroperitoneal tumour surgeries	5-7	10
Robotic HPB & UGI procedures	05	25
Laparoscopic HPB & UGI procedures	05	25