



Fellowship in HPB Surgery

Education and Training

Dated 26th February, 2009

Introduction

The purpose of this document is to define the learning objectives of a HPB surgery fellowship as administered by the Australian and New Zealand Hepatic, Pancreatic and Biliary Association (ANZHPBA). This fellowship is designed to follow the current FRACS for General Surgery training. It is an expectation of the RACS that a qualified surgeon is knowledgeable in the management of HPB surgery, therefore, this fellowship and subsequent curriculum will not restate those learning objectives required of all general surgeons but rather build upon these concepts.

The purpose of Fellowship education in HPB Surgery is to provide a structured educational and training experience necessary to achieve expertise in the understanding, diagnosis, and management (including the necessary surgical skills) in the treatment of diseases of the liver, pancreas, and biliary tract.

This curriculum provides:

- HPB Surgery Program Directors with a basis for instruction and evaluation of Fellows
- Fellows with a guide to the study of HPB Surgery and defines the essential areas of knowledge and technical skills that need to be mastered.
- HPB Units with a set of guidelines to reach sufficient standards for accreditation to qualify for fellow placement.

Definitions

HPB Surgeon

A HPB surgeon is a specialist surgeon who has obtained training and experience in the multidisciplinary approach to the diagnosis and treatment of patients with HPB disorders and provides leadership and devotes a major portion (over 50%) of his/her professional practice to these activities as well as HPB education and research.

HPB Training Program

A HPB training program should provide core knowledge and expertise to prepare its graduates to be expert HPB surgeons who interact with a multidisciplinary team to provide comprehensive care for HPB patients as well as leadership in the surgical, medical and lay communities in matters pertaining to HPB disease.

HPB Unit

A surgical unit with a significant workload in HPB surgery, including preoperative work-up, operative care and post op follow-up of a wide range of HPB surgical diseases. There should be access to and involvement in multi-disciplinary care and meetings. The unit workload may be across more than one campus (public or private) but must remain coordinated through a central organizational process.

The training responsibilities of the ANZ HPBA include:

- (a) Training of specialised Hepato-Pancreato-Biliary Surgeons through a fellowship training programme. This will remain the top training priority of the ANZHPBA.

(b) Training of pre-fellowship General Surgeons.

Provide the HPB component of Fellowship training in General Surgery through GSA.

PROGRAM REQUIREMENTS

General Requirements

An HPB Fellowship consists of a minimum of 2 years of education and training following completion of a general surgery fellowship. This needs to consist of at least two different locations for training at least one year each, one of the years should be in Australia and New Zealand. A portion of the program should be devoted to clinical research. It is desirable that fellows should have access to faculty (not necessarily the HPB surgeon) who can mentor them in basic science research and have the option for such an experience if desired.

An adequate opportunity should be provided to interact with interventional radiologists, pancreatobiliary endoscopists, gastroenterologists, hepatologists, transplant surgeons, medical oncologists, radiation oncologists, and pathologists. These experiences may be obtained by formal rotations on specialty services, participation in structured multidisciplinary conferences, attendance at specialty tumor clinics, or inclusion of specialty patients on a single HPB service.

Initial outpatient assessment, preoperative decision making, perioperative management, and patient follow-up are essential to the training experience. To the greatest extent possible, HPB fellows should participate in the preoperative evaluation, assessment, treatment planning, and postoperative ambulatory care of patients in whose surgery they participate. As a guide, HPB fellows should see preoperative and postoperative ambulatory patients at least one day per week.

Clinical experience alone is insufficient education in HPB surgery. The training program must develop a regularly scheduled didactic program consisting of conferences, lectures, debate series, and/or journal club, covering not only clinical surgical problems but also nonsurgical, basic science, clinical research, and ethical problems. HPB fellows must participate, and program directors must be able to provide proof of fellow attendance at didactic conferences.

The HPB surgery fellowship program must not conflict with the regular general surgical training programs at the participating institution. HPB fellows' clinical responsibilities must be in accordance with the guidelines of governing surgical trainee review bodies. In most circumstances, an HPB fellow should not be responsible for the same patients or for the same service as the most senior general surgical trainee. In other words, the fellows' experience should not diminish the experience of general surgery trainees in their final year of training. Rather, an HPB surgery fellowship program should complement an institution's general surgery training program by developing a focus of excellence in HPB management that can be observed and experienced by all surgical trainees and attending staff.

The HPB fellowship sponsoring institution must be accredited by the ANZHPBA training committee. The general surgery training program of the sponsoring institution must be fully accredited by the RACS.

The institution must provide an appropriate educational environment and ensure appropriate trainee supervision. Patient support services, work hours, and on-call schedules should be in accordance with RACS standards and allow HPB fellows to participate in scholarly activities such as in-house didactic conferences as well as local, regional and national meetings. Access to a library and on-site electronic literature retrieval capabilities are required.

The program director must be accredited in general surgery and a member of the ANZHPBA.

The faculty must demonstrate evidence of scholarly activity in HPB disease, as evidenced by participation in basic science research and/or clinical research protocols; presentations at local, regional, or national meetings; and/or publications in peer-reviewed journals.

Each HPB fellow's progress during the program must be formally evaluated in writing and feedback provided to the fellow at least semi-annually by the HPB program director and faculty. The HPB fellow should be advised of any deficiencies in time to correct problems prior to completion of the fellowship. 6 monthly reports by both trainee and program director should be provided to the ANZHPBA training committee.

HPB fellows must be given the opportunity to evaluate the program overall, as well as all rotations, conferences, and faculty. These evaluations should be obtained in as confidential a manner as possible. The program director should regularly assess the post-training clinical and research activities of past HPB surgery fellows to determine whether the goals of the training programs are being achieved, namely, the production of effective HPB surgery specialists.

Additional Essential HPB Training

The fellowship must provide exposure to and experience in the multidisciplinary management of HPB disease.

The fellowship must provide opportunities to participate in multidisciplinary clinics, tumor boards, or conferences. Specialists involved in these opportunities should include interventional radiologists, pancreatobiliary endoscopists, gastroenterologists, hepatologists, medical oncologists, radiation oncologists, pathologists, and transplant surgeons.

HPB fellows also should gain experience in providing supportive care to HPB patients, including pain management and parenteral and enteral alimentation, as well as rendering emergency surgical care. HPB fellows also should have an understanding of rehabilitative services in various settings.

Research Training

Clinical research must be included in the training program. HPB fellows should have opportunities to design and implement clinical research protocols, and each HPB fellow should initiate or participate in an investigative project and should be sufficiently familiar with statistical methods to properly evaluate research results. Presentation and peer-reviewed publication of at least one research project is expected.

The ANZHPBA Training Board

Membership of the Training Board

The Training Board will be comprised of:
Six members nominated by the ANZHPBA.

Chairman of the Training Board

The Chairman will be elected by the Council of the ANZHPBA from within the six members. The minimum term of appointment shall be 3 years, with a maximum of 6 years. The Chairman may be re-elected on a three year basis. The Chairman will represent the training committee on the Post Fellowship Committee of the RACS.

Secretary of the Training Board

The Secretary shall be elected by and from within the six nominated Board members. The Chairman may also act as Secretary if agreed to by the Executive of the ANZHPBA.

Co-opted Person(s)

The Chairman of the Board has the right to co-opt any suitable person to the Committee. Such appointee will have no voting rights, but will be co-opted for activities such as program site inspections and applicant interviews. The term of appointment is 6 months, renewable for additional 6 monthly terms if appropriate.

Training Board Meetings

The Training Board must meet at 6 monthly intervals including the time of Annual Scientific Congress, at which time the office bearers will be appointed.

Training Board Responsibilities

- a. Establish and supervise Fellowship training in HPB surgery in Australia and New Zealand including selection and assessment.
- b. Assist with the syllabus for the three year advanced general surgical training program.
- c. Advise the Censor-in-Chief, the Board in General Surgery, the Executive of the Section of HPB Surgery, and the Council of the ANZHPBA on any matter pertaining to training in HPB surgery.
- d. The Training Board in HPB Surgery will abide by any regulations applicable to all Boards, as determined from time to time by the College.
- e. Accreditation for HPB training positions in Australia and New Zealand.
- f. Selection of trainees and unit allocation of trainees.

Core Competencies

The goals and objectives of the ANZHBA are to achieve the following core competencies in HPB training.

1. Patient Care
This will include: technical expertise (including operative, endoscopic and laparoscopic skills); medical knowledge; judgement and clinical decision making.
2. Interpersonal and Communication skills
3. Scholar and teacher
4. Professionalism
5. Leadership

1. Patient care

Fellows will be expected to perform pre operative assessment of patients, demonstrate an understanding of the management options, indications and contraindications and complications associated with recommended procedures.

An understanding of and ability to order, integrate and interpret peri operative testing and evaluation related to HPB surgery.

Demonstrate a high level of medical knowledge related to the conditions of HPB disorders.

Demonstrate clinical, intra operative and peri operative decision making that is based upon sound medical knowledge that minimises complications and demonstrates an awareness of the limitations of clinical experience and technical skills.

Develop fundamental competency of technical laparoscopic and endoscopic skills related to the practice of HPB surgery.

2. Interpersonal and Communication skills.

The Fellow is able to provide concise and accurate communication of clinical information, with colleagues and other health related personnel.

Provide effective communication with patients and family members that creates and sustains a professional relationship.

Demonstrate caring attitudes towards patients and families.

Maintain comprehensive and clear medical records.

3. Scholar and Teacher

The Fellow should be diligent in updating knowledge and skill bases by constantly viewing the medical literature and attending professional meetings and interaction with colleagues.

Critically evaluate medical information and apply appropriately to clinical decisions.

Facilitate the learning of undergraduates, surgical trainees, health professionals and the community.

Contribute to the dissemination of and application of medical knowledge through research, teaching and communication in general.

4. Professionalism

Demonstrate a commitment to the patients, profession and community through ethical practice.

Display honesty and admission of limitations to provide patients with optimal care.

Display compassion and respect for all patients and be the advocate for patients needs.

Have a commitment to teamwork and offer assistance to colleagues in need.

Recognise medico legal issues, respect patient confidentiality and apply appropriate government regulations to medical practice.

5. Leadership

Manage and lead clinical teams in an efficient and harmonious manner to optimise patient management.

Serve in administration and leadership roles as appropriate.

Work in collaboration with multidisciplinary teams to advance the field of HPB surgery and the management of patients with HPB conditions.

Requirements

A successful Fellowship in HPB surgery will involve the following:

1. Satisfactory completion of the curriculum requirements.
2. Completion of research requirements.
3. A minimum of 2 years of clinical training in the surgical management of HPB disorders in a post accredited by the ANZHPA. This may be nationally or overseas. The clinical training may be altered according to specific sub specialities requirements.

If ERCP and endoscopy training is included, this must satisfy the conjoint committee requirements and may require an additional period of training.

If liver/pancreas transplantation training is required, a further 12 months of training is required in conjunction with the Section of Transplantation Surgery.

4. Successful case load achievement.

There should be flexibility in the clinical exposure required depending on the complexity and profile of the unit. In general, there should be adequate case mix and case load to reach the required proficiency. The Fellow will maintain a detailed log book (See example).

The emphasis will be on obtaining competence rather than achievement of numbers alone. However it is expected that a training unit would have a minimum throughput of 20 liver resections and 10 pancreas resections per year. For units that are pancreas predominant 25-30 pancreas resections per year would be expected. Private sector cases can be used to increase exposure.

5. Assessment

The Fellow must achieve satisfactory 6 monthly reports from the respective unit and an overall satisfactory report covering the entirety of the program.

- a. The assessment should be performed at six monthly intervals by the unit. Any deficiencies should be addressed and documented with a clear strategy to rectify these deficiencies.
 - b. A formal exit examination is currently under review.
6. If a Fellow has been assessed as achieving an unsatisfactory performance, a meeting between the unit and the fellow must be held where the reasons for the unsatisfactory performance are enunciated. A written report is sent to the ANZHPA training committee where a decision regarding further training (12 months) or dismissal from the program is made. In general, additional training should not extend beyond a 12 month term. The Fellow has the opportunity for an appeals process.
7. Additional research training for a higher degree will not replace the clinical training requirements.

Log Book Documentation for HPB Fellowship Web based

Procedure	Surgeon mentor scrubbed	Surgeon mentor in theatre	Surgeon mentor available	Assisting surgeon mentor	Total
Gallbladder Surgery					
Open cholecystectomy					
Cholecystectomy + op cholangiogram (open)					
Laparoscopic cholecystectomy					
Cholecystectomy + op cholangiogram (laparoscopic)					
Cholecystectomy + Common bile duct exploration (open)					
Cholecystectomy + CBDE (laparoscopic)					
choledochoscopy					
CBDE without cholecystectomy					
Insertion tube /stent					
Transduodenal sphincteroplasty					
Other -specify					
Bile Duct Surgery					
choledochoenterostomy					
Gastroenterostomy and choledochoenterostomy					
Hepaticojejunostomy – to confluence					
Left hepaticojejunostomy					
Right hepaticojejunostomy					
Laparoscopic biliary bypass					
Bile duct reconstruction for injury or benign stricture					
Bile duct reconstruction for tumour					
Resection for hilar cholangiocarcinoma					
Radical node dissection					
Choledochal cyst excision					
Other -specify					
Liver Surgery					
Radical cholecystectomy and liver resection					
Insertion of infusaport					
Right hepatectomy					
Right trisectionectomy					
Left hepatectomy 234					
Left hepatectomy 23					
Liver segmental resection					
Non anatomical resection					
Laparoscopic liver resection specify					
Intra operative ultrasound					
Hepatic trauma resection					
Operative management of hepatic trauma (specify)					
Ablation procedure for liver tumour					
Other -specify					

Liver transplantation					
donor organ retrieval					
backbench					
Recipient hepatectomy					
venous anastomosis					
Arterial anastomosis or reconstruction vascular graft					
Biliary anastomosis					
Other - specify					
Other Liver Surgery					
Shunt surgery for portal hypertension					
Devascularisation procedures for portal hypertension					
Fenestration of liver cysts (open)					
Fenestration liver cysts (laparoscopic)					
Hydatid Surgery (specify)					
Liver abscess surgery					
Insertion infusion device					
Other - specify					
Pancreas and Duodenum					
Pancreaticoduodenectomy (open-laparoscopic)					
Pancreaticoduodenectomy (pylorus preserving)					
- Vascular reconstruction					
Retroperitoneal node dissection					
Distal pancreatectomy (open laparoscopic)					
Spleen preserving distal pancreatectomy					
Central pancreatectomy					
Enucleation of pancreatic endocrine tumour					
Other (specify)					
Total pancreatectomy					
Duodenal preserving pancreatectomy (Begers)					
Pancreas sparing duodenectomy					
Freys procedure					
Pancreaticojejunostomy					
Pseudocyst gastrostomy					
Pseudocyst enterostomy					
External drainage pseudocyst					
Pancreatic necrosectomy - open					
- laparoscopic					
- percutaneous					
Local excision duodenal tumour					
Duodenal exclusion procedures					
Pancreatic Duct sphincteroplasty					
Operations for visceral aneurisms					
Operations for nerve ablation procedures					
Pancreas transplantation					
Other (specify)					
Spleen operations					

Splenectomy (laparoscopic)					
Splenectomy (open)					
Splenectomy for massive spleen					
Splenorrhaphy					
Other spleen operations (specify)					
Other Operations					
Staging laparoscopy and/or biopsy					
Laparoscopy US					
Laparoscopy RFA/Microwave					
Feeding jejunostomy					
Feeding gastrostomy					
Laparotomy for abdominal sepsis/peritonitis lavage					
Laparotomy for post op bleeding					
Small bowel resection with anastomosis					
Large bowel resection with anastomosis					
Bowel Resection with ileostomy/colostomy					
Non shunt surgery in cirrhosis					
Abdominal wall hernias					
Others (specify)					
Non HPB surgery in OLT patients (specify)					
Conservative					
Liver primary malignancy - conservative					
- RFA					
- TACE					
Liver secondary malignancy conservative					
- RFA					
- TACE					
- SIRT					
Malignant obstructive jaundice - conservative					
- stenting					
(Specify site):					
Duodenal /gastric obstruction - stenting					
Malignancy - conservative					
Specify site					
MDT meetings					
Non malignant jaundice - conservative					
ERCP/sphincterotomy					
Lithotripsy					
Stenting					
Acute pancreatitis - conservative					
ERCP					
Percutaneous drainage					
GI haemorrhage (non PHT) - conservative					
- angiography					
Variceal bleeding - conservative					
- banding/sclerotherapy					
- angiography					

- TIPS					
Liver cysts					
Adenoma, FNH incidentaloma					
Ascites - conservative aspiration					
- TIPS					
- Peritoneovenous shunt					

Comments

Selection Criteria

1. Application and Eligibility

All candidates who have successfully completed FRACS or equivalent in general surgery and have appropriate medical registration are eligible to apply for the Fellowship in Hepato Pancreato Biliary Surgery. Applications for the Fellowship will be interviewed usually in May for the following year. Applications will be considered by the Training Committee of the ANZHPBA.

2. Selection Tools

Selection of candidates into the HPB Fellowship program will be determined by the following selection tools:

Curriculum Vitae	30 %
Interview	30 %
Referees reports	40 %

The number of positions will be dependant on the availability of accredited positions and quality of candidates

Curriculum Vitae

During scoring of an application points will be awarded to the following:

- Experience in general surgery
- Experience in HPB surgery
- Time from FRACS or equivalent
- Higher degree
- Research
- Publications - quality of journals etc
- Presentations at national or international meetings
- Administrative involvement and organisational skills
- Other activities – leadership qualities

Interviews

Structured .

Only shortlisted candidates will be required for the interview.

Referees Reports

A minimum of five referees report will be requested. These may be structured written referee's reports or signed structured telephone references.

3. Notification of the successful candidates (with CV's) to appropriate hospital administration for approval and comment prior to confirmation.
4. Feedback to unsuccessful candidates.

Hospital Accreditation

A **HPB Surgery Unit** would be defined as a clinical team of at least two, but preferably three, surgeons plus related staff.

Surgeons

The Unit should consist of a Unit Head and at least one other surgeon with the following specifications:

- a. FRACS.
- b. Postgraduate HPB surgery training, either within Australia/New Zealand and overseas.
- c. Member of the ANZHPBA.
- d. Practices either exclusively HPB surgery or as a gastrointestinal surgeon where at least 50% of the patients managed are in HPB surgery.

Nurse Unit Manager & Staff

The HPB Unit should have access to one ward, or part thereof, to serve the majority of the patients admitted to that Unit. Ideally, the ward should be shared with the Gastroenterology Unit and/or Gastrointestinal Surgery Units of the hospital.

Ancillary Staff

The Unit should have available, other allied health professionals to provide a spectrum of care (for example physiotherapy, occupational therapy and medical social worker, pastoral care and liaison psychiatry).

THE HOSPITAL AND SUPPORTIVE SERVICES

To support a **HPB Surgery Unit**, the hospital involved should have availability of the following services:

- Laboratory and Anatomical Pathology with a 24 hour frozen section service.
- Intensive Care Unit and/or High Dependency Unit with the capacity to manage epidural anaesthesia.
- Operating Theatres with a fully staffed recovery room.
- Anaesthetic Department with at least one member of the anaesthetic staff with a particular interest in HPB surgery.
- Operating theatre nursing and technical staff with at least one team with a specific interest in HPB surgery and facilities for advanced laparoscopic surgery, intra operative ultrasound and RFA.
- A purpose built independent Endoscopy Suite or an Endoscopy Suite incorporated in the Operating Theatre with a dedicated Nurse Unit Manager and back-up staff for ERCP, IOUS and interventional radiology.
- Radiological sciences and an accredited imaging department with facilities for x-ray screening, CT scan, Visceral Angiography and Scintillation Scan.
- Oncology and Radiotherapy access either within the hospital, or region for ambulatory care or inpatient radiotherapy and chemotherapy. Specifically the availability of an inpatient consultative service in medical oncology and radiotherapy.

SPECIFICATIONS AND FUNCTION OF THE HPB SURGERY UNIT

Day Surgery

The hospital should have access to a Day Surgery facility.

Operating

The fellow should have access to on average at least a full day operating list per week.

Pre-admission Process

The Unit should have access to a pre-admission clinic or similar arrangement to assess elective surgical patients.

Outpatient or Private Office Assessment

The Unit should have a dedicated outpatient clinic

After Hours Cover

The Unit should provide an exclusive or consultative on-call service 24 hours a day, 7 days a week for Accident & Emergency and inpatient emergencies.

Weekly Ward Rounds and Meetings

The Unit should meet on a weekly basis to conduct meetings to discuss the patients, protocols or any other business combined at some stage with a visit to the patients (ward round).

Quality Assurance and Audit

The Unit should be involved in a regular mortality and morbidity meeting, at least on a monthly basis with a six monthly or annual review, and establish a HPB Surgery Database. Quality assurance programs (for example Clinical Indicators or quality projects) should become standard and reviewed at the weekly Unit meetings or audit meetings.

Research

The Unit shall have an interest in research either by encouraging individual research projects within the hospital or collaborating with existing clinical research projects. It is expected that a training unit have a track record with peer reviewed publications over the last 5 years.

Academic Affiliation

The Unit should have an affiliation with one of the University Medical Schools and be involved in Undergraduate Teaching Programs.

Basic and Advanced Training in General/HPB Surgery

Members of the Unit should be involved with the RACS activities to encourage surgical trainees in basic and advanced training in General and HPB Surgery.

The training unit must have RACS accreditation for advanced training in general surgery.

CME and Recertification

The Unit head should be responsible for ensuring that the Guidelines provided by the Section of HPB Surgery of the Royal Australasian College of Surgeons are fulfilled and participate in CME activities.

The purpose of hospital accreditation is to ensure the highest quality of training for the HPB Fellowship and that the approved posts provide appropriate supervision and learning environment to the prescribed standard.

1. The process for accreditation for appropriate centres for training in HPB surgery will be initiated by the HPB unit in conjunction with the hospital administration.

The appropriate documentation will be completed and sent to the ANZHPBA training committee (see details).

2. The inspection will consist of at least 2 members of the ANZHPBA Training Committee.

Accreditation will be provided on a five year basis. Provisions for limited accreditation for one year and subsequent review should be available.

3. The recommendation of the supervisory team will be communicated to the ANZHPBA training committee and council and subsequently sent to the CEO of the hospital for comments.

The final draft will be presented to the ANZHPBA executive for final approval.

4. The applicant hospital has the right of appeal if accreditation is not given or withdrawn.
5. The accreditation committee should allow for at least half day for the accreditation process. Meetings normally would include:
 - (a) Meeting with CEO and administrative staff of hospital and supervisor of HPB training to discuss general issues.
 - (b) Meeting with members of the HPB unit to discuss case load and other issues.
 - (c) Individual confidential meetings with current trainee(s).
 - (d) Inspection of the facilities.
 - (e) Briefing session to the whole team regarding issues of concern.

Summary Assessment Form by ANZHPBA Accreditation Team

**Hospital
Inspecting Team
Members of Surgical Team**

Date of Inspection

**Quality of presentation
Quality of provided material**

Clinical Coverage	NS	S	G	E	Comments
Major operations Numbers:					
Minor operations Numbers:					
Consultant led ward rounds					
Emergency vs elective mix					
On call emergency roster					
Outpatient services and patient reviews					
Multidisciplinary Clinics					
Operating Lists Numbers:					
Fellow log Books/ level of supervision					
Support Services					
Radiology					
Oncology					
Hepatology					
Endoscopy ERCP EUS					
Emergency Department					
Hospital					
Structure of surgical department					
General education facilities					
Surgical Education Training Program					
Audit process					
Hospital management support					
Physical Environment desk office /space					
Computer/internet access					
Library facilities					
Team Structure – Unit Activities					
Adequate consultant and supervisory staff					
Adequate interns and surgical trainees					
Adequate secretarial staff					
Adequate staff for teaching					
Audit meetings					
Radiology meetings					

Pathology meetings					
Unit ward rounds/business meetings					
Research					
Number of publications					
Quality of publications					
Number of presentations state, national and international					
Structure for research higher degrees					
Infrastructure support for research					

Comments:

Recommendations

Suggestions for Improvement

Signatures:

Detailed Assessment Form - Request for Hospital Accreditation

Standard 1 – Education facilities and systems required

All trainees must have access to the appropriate educational facilities and systems required to undertake training

Accreditation Criteria	Factors Assessed	Minimum Requirements
1. Computer facilities with IT support	Computer facilities and Internet/ broadband access	<ul style="list-style-type: none"> • Computers and facilities available for information management, online references and computer searches • Terminals available at flexible sites which may include remote access • 24-hour computer access acknowledging security issues
2. Tutorial room available	Feedback from supervisor and trainees	<ul style="list-style-type: none"> • Tutorial rooms available when required
3. Access to private study area	Designated study area Feedback from trainees	<ul style="list-style-type: none"> • Designated study area/room available isolated from busy clinical areas • 24-hour access acknowledging security issues
4. Educational activities within the unit	Weekly hospital educational program Feedback from trainees	<ul style="list-style-type: none"> • Weekly meetings • Opportunities for trainees to present cases/topics

Standard 2 - Quality of education, training and learning

Trainees will have opportunities to participate in a range of desirable activities, the focus of which is inclusive of their educational requirements

Accreditation Criteria	Factors Assessed	Minimum Requirements
5. Coordinated schedule of learning experiences for each trainee	Publicised monthly timetable of activities which incorporate the learning needs of the trainee	<ul style="list-style-type: none"> • Weekly Imaging meeting • One formal structured tutorial per fortnight
6. Access to external educational activities for trainees	Documented hospital HR Policy on educational leave for trainees Documentation on equipment provided Feedback from trainees	<ul style="list-style-type: none"> • Trainees given negotiated educational leave to attend obligatory face-to-face RACS/Specialty courses • For other significant courses, modern educational approaches to distance learning, e.g. videoconferencing, available or being explored • Evidence to confirm leave is provided
Accreditation Criteria	Factors Assessed	Minimum Requirements
7. Opportunities for research, inquiry and scholarly activity	Recent or current research funding, publications, current research projects, recognized innovation in medicine, clinical care or medical administration Feedback from trainees	<ul style="list-style-type: none"> • Regular research meetings • Trainees enabled to access medical records, once ethical approval (if necessary) for the project is obtained

Standard 3 – Surgical supervisors and staff

Program managed by appropriate and accessible supervisor supported by the institution and committed surgeons, delivering regular education, training, assessment and feedback

Accreditation Criteria	Factors Assessed	Minimum Requirements
8. Designated supervisor of HPB training	Documentation of supervisor Feedback from trainees	<ul style="list-style-type: none"> Clearly identifiable and named supervisor FRACS in relevant specialty and Member of ANZHPBA Regularly available and accessible to trainees
9. Specialist surgical staff appropriately qualified to carry out surgical training	Documentation on qualifications of specialist surgical staff	<ul style="list-style-type: none"> Surgeons have FRACS or RACS recognised equivalent in that specialty and current experience in subspecialty areas where required for training
10. Surgeons committed to the training program	Weekly scheduled educational activities of surgeons Feedback from trainees	<ul style="list-style-type: none"> Surgeons attend scheduled educational and audit meetings All surgeons foster the learning of core competencies (responsibility shared by surgeons and hospital)
11. Regular supervision, workplace-based assessment and feedback to trainees	Documentation on hospital/department practices relating to supervision, workplace based assessment and feedback to trainees Feedback from trainees	<ul style="list-style-type: none"> Goals discussed and agreed between surgeon and trainee at the commencement of each surgical rotation One-to-one regular supervision One-to-one constructive feedback on performance every three months Opportunities provided for trainee to rectify any weaknesses
12. Hospital support for surgeons involved in education and training	Documentation on weekly service and educational activities of surgical staff HR Policy on educational leave Secretarial services available for supervisor's role Feedback from surgeons	<ul style="list-style-type: none"> Negotiated time for supervision/teaching Negotiated leave for surgeons who attend meetings and educational courses Accessible secretarial services for supervisor's role related to training

Standard 4 – Support services for trainees

Hospitals and their networks committed to the education, training, learning and wellbeing of trainees who in turn acknowledge their professional responsibilities

Accreditation Criteria	Factors Assessed	Minimum Requirements
13. Hospital support for trainees	<p>Safe hours practiced</p> <p>Safety procedures for trainees leaving the hospital outside normal working hours</p> <p>Hospital environment is free of intimidation, harassment and abuse of trainees</p> <p>Level and accessibility of HR services</p> <p>Feedback from Trainees</p>	<ul style="list-style-type: none"> • Rosters and work schedules in Australia take into account the principles outlined in the AMA National Code of Practice, Hours of Work, Shift Work, and Rostering for Hospital Doctors⁷, and in New Zealand • the principles outlined in the Multi Employer Collective Agreement (MECA) • Hospital promotes trainee safety and provide security when necessary • Hospital does not allow trainee to be intimidated, harassed or abused • Readily accessible Human Resources service available to trainees including counselling if required • Allocation of clinical rotations take trainee’s career/surgical specialty aspirations and requirements into account (joint hospital/supervisor responsibility)
14. Trainees’ professional responsibilities – Duty of Care	Feedback from employers	<ul style="list-style-type: none"> • Trainees’ recognition of the concept of Duty of Care • Joint trainee/supervisor and College responsibility

Standard 5 - Clinical load and theatre sessions

Trainees must have access to a range and volume of clinical and operative experience which will enable them to acquire the competencies required to be a surgeon

Accreditation Criteria	Factors Assessed	Minimum Requirements
15. Supervised consultative ambulatory clinics in consultative practice	<p>Documentation on frequency of consultative clinics</p> <p>Documentation which shows trainees see new and follow-up patients</p> <p>Documentation on alternatives provided if no consultative clinics available in the hospital</p>	<ul style="list-style-type: none"> • Trainees attend a minimum of one consultative clinic per week • Trainees see new and follow-up patients under supervision • Trainees attend alternative supervised consultative clinics
16. Beds available for relevant specialty	Documentation on accessible beds for specialty	Sufficient beds to accommodate caseload required for training
17. Consultant led ward rounds with educational as well as clinical goals	<p>Documentation on the frequency of consultant led scheduled ward rounds</p> <p>Feedback from trainees</p>	<ul style="list-style-type: none"> • Two per week • Teaching of trainees on each ward round
18. Caseload and case mix	Summary statistics of number	• Regular elective and acute admissions. This

	and case mix of surgical cases managed by the relevant specialty in the previous year	will vary depending on the type of service and the case mix. (General guidelines will be provided as HPB program develops) • Number and case mix varies between specialties and the focus is on competence acquisition (same as preceding point)
19. Operative experience for trainees	Documentation on weekly theatre schedule Evidence of trainees' exposure to emergency operative surgery Evidence of specialist trainees' access to "index" cases from trainees' log book and feedback	<ul style="list-style-type: none"> • Minimum of three elective theatre sessions per week per specialist trainee (focus is on opportunities to gain required competencies and is based on a combination of theatre time, case numbers and case mix) • No conflicting service demands which interfere with required operative experience by trainee • Number and level of surgical procedures varies with stage of training. The focus is on competence acquisition • Rosters and work schedules enable trainee to participate in emergency surgery • Specialist trainees have priority access to those indexed cases required for their training
20. Experience in perioperative care	Timetable of postoperative ward rounds	<ul style="list-style-type: none"> • Scheduled daily postoperative ward rounds & discussion with consultants
21. Access to ambulatory care surgery	Documentation on access to ambulatory care surgery	<ul style="list-style-type: none"> • Regular weekly experience with ambulatory care surgical procedures
22. Involvement in acute/emergency care of surgical patients	Documentation showing frequency of involvement in acute/emergency care of surgical patients	<ul style="list-style-type: none"> • Weekly (minimum of 1 in 7) involvement in acute/ emergency care of surgical patients

Standard 6 - Equipment and clinical support services

A hospital must have the facilities, equipment and clinical support services required to manage surgical cases in a particular specialty

23. Theatre equipment	Documentation on equipment available Feedback from surgeons and trainees	
24. Support/ancillary services	Documentation on services Feedback from surgeons and trainees	

Standard 7 - Clinical governance, quality and safety
A hospital involved in surgical training must be fully accredited and have the governance structure to deliver and monitor safe surgical practices

Accreditation Criteria	Factors Assessed	Minimum Requirements
25. Head of Surgical Department and governance role	Documentation on structure of surgical department Position description and reporting lines	<ul style="list-style-type: none"> • Designated Head with negotiated role in governance and leadership
26. Hospital Credentialing or Privileging Committee	Documentation on Credentialing or Privileging Committee and its activities	<ul style="list-style-type: none"> • Clinicians credentialed at least every 5 years
27. Surgical audit and peer review program	Documentation on audit and peer review program for unit	<ul style="list-style-type: none"> • Monthly audit review of morbidity/mortality • All surgical staff participate • Opportunity for trainees to participate
28. Experience available to trainees in root cause analysis	Documentation on root cause analysis education Feedback from trainees	<ul style="list-style-type: none"> • Training and participation occurs in root cause analysis

Curriculum

At the conclusion of the fellowship in HPB surgery, the fellow will be able to provide comprehensive, state-of-the-art medical and surgical care to patients with surgical disorders/disease of the liver, pancreas, biliary tract, duodenum and spleen. The curriculum for training will consist of 5 modules. The modules of the curriculum include:

Module I Anatomy

Module II Pathophysiology

Module III Peri operative Care

Subunit A General Principles

Subunit B Radiology

Subunit C Oncology

Module IV Clinical

Subunit A Biliary tract

Subunit B Pancreas and Duodenum spleen

Subunit C Liver

Module V Research and Education

MODULE I

ANATOMY

Recommended Reading

Mandatory Courses

Optional Courses: Diploma in Anatomy

Assessment: Continuous assessment, Written exit examination

1. Objectives:

- (a) Embryology of the dorsal mesogastrium (liver, biliary tract, pancreas and spleen), diaphragm and potential anomalies.
- (b) The anatomy of the liver, biliary tract, pancreas and spleen and relationship with the adjacent foregut structures.

2. Content

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

2.2 Liver

2.2.1 Intrahepatic anatomy of the liver:

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

2.2.2 Extrahepatic anatomy of the liver

- Lobes, sectors and segments
- Nomenclature systems
- Ligaments, fissures and incisures
- Anomalies

2.2.3 Anatomy of the porta and extrahepatic veins

- Portal vein, hepatic artery and anomalies
- Gallbladder and bile ducts and anomalies
- Lymphatic drainage and nodal anatomy

2.2.4 Anatomy of the diaphragm, subphrenic and retrohepatic spaces

- Anatomy of the diaphragm including structure and composition, Ligamentous attachments and relations to adjacent structures
- Relationship of bare area, subphrenic and subhepatic spaces
- IVC and its branches including extrahepatic veins
- Adrenal and right kidney

2.3 Biliary Tract including Gallbladder

- 2.3.1 Anatomy of the hepatic ducts and biliary plate
 - Segmental duct anatomy and variants of normal
 - Blood supply and lymphatic drainage
 - Relationship with other portal structures

- 2.3.2 Anatomy of the gallbladder, cystic duct and bile duct
 - Structure, relationship to other portal and adjacent structures
 - Sphincter of Oddi and Ampulla of Vater
 - Blood supply and lymphatic drainage
 - Variants of normal and anomalies
 - Histology of gallbladder and biliary tract

2.4 Pancreas and Duodenum

- 2.4.1 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

- 2.4.2 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

2.5 Spleen

- 2.5.1 Anatomy of the 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

2.6 Diaphragm

- 2.6.1 Embryology and composition of the diaphragm
- 2.6.2 Knowledge of the attachments of the diaphragm and traversing structures
- 2.6.3 Relationships of adjacent organs

MODULE II

PATHOPHYSIOLOGY

Recommended Reading:

Assessment: Continuous assessment, written exit examination

1. Objectives:

Upon completion of this module, the Fellow will:

- 1.1 Have a thorough knowledge and understanding of the normal physiology of the liver, biliary tract, pancreas and spleen.
- 1.2 Have a thorough knowledge of relevant investigations including interpretation of normal and abnormal biochemical parameters correlating with the clinical situation.
- 1.3 A thorough knowledge of the underlying aetiology, pathogenesis and natural history of pathological conditions of the liver, biliary tract, pancreas and spleen.

2. Content

2.1 Physiology of the Liver and Biliary tract

- 2.1.1 Bilirubin metabolism, bile production and synthesis
- 2.1.2 Coagulation factors – synthesis and pathways
- 2.1.3 Clinically relevant metabolic pathways of the liver
- 2.1.4 Hemodynamics and regulation of hepatic blood flow
- 2.1.5 Mechanisms of liver regeneration
- 2.1.6 Underlying mechanisms involved in liver hyperplasia hypertrophy and atrophy
- 2.1.7 Cellular function (hepatocytes, kupffer cells, stellate cells)
- 2.1.8 Liver immunology
- 2.1.9 Hormonal influences on the liver and biliary tract
- 2.1.10 Biliary tract motility (including gallbladder and sphincter of Oddi)
- 2.1.11 Biliary epithelium and gallbladder function
- 2.1.12 Factors in the production of biliary pain

2.2 Interpretation of Liver Function Tests

- 2.2.1 Normal
- 2.2.2 Markers of cholestasis and cholangitis
- 2.2.3 Synthetic function: INR, clotting factors, albumin, bilirubin
- 2.2.4 Tumour markers: CEA, alpha FP
- 2.2.5 Significance of liver function clearance tests ICG, MEGX
- 2.2.6 Interpretation of liver biopsy

2.3 Pathology of the gallbladder and biliary tract

Non neoplastic

- 2.3.1 The epidemiology, aetiology, pathogenesis and complications of gallstones and common duct stones
- 2.3.2 Aetiology and pathogenesis of biliary dyskinesia
- 2.3.3 Biliary sepsis and obstruction
 - The role of bacteria, endotoxins and cytokines in biliary sepsis
 - Aetiology and pathophysiology of suppurative ascending cholangitis
 - Aetiology and pathophysiology of obstructive jaundice
 - Epidemiology, aetiology and pathogenesis of acute and Chronic cholecystitis, including acalculous, empyema and emphysematous cholecystitis
 - Aetiology and pathophysiology of biliary peritonitis
 - Parasitic infections of the biliary tree – aetiology and pathology
 - Epidemiology, aetiology, pathogenesis and complications of intrahepatic stones and recurrent pyogenic cholangitis
- 2.3.4 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
- 2.3.5 Biliary fistulas – etiology, pathogenesis and complications
 - External
 - Internal - including gallstone ileus and Mirizzi Syndrome
- 2.3.6 Biliary cysts including Caroli's Disease
 - Epidemiology, aetiology, classification, pathogenesis and complications
- 2.3.7 Blunt and penetrating trauma to the biliary tract

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

2.3.8 Congenital

- Biliary atresia, congenital hepatic fibrosis Alagille syndrome

Tumours of the gallbladder and biliary tract

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

2.3.9 Benign tumours and pseudotumours of the biliary tract

- Incidence, pathological classification

2.3.10 Tumours of the Gallbladder

- Benign: gallbladder polyps-incidence, etiology, pathogenesis and natural history
- Malignant: incidence, aetiology and pathogenesis, histological classification, molecular biology and patterns of spread. Staging

2.3.11 Intrahepatic and extrahepatic biliary cancer

- Pathophysiology of malignant obstructive jaundice
- Hilar cholangiocarcinoma: Incidence, aetiology and histological classification patterns of spread genetics and molecular biology Staging

2.4 Pathology of the Liver

Non neoplastic disorders

2.4.1 Liver Infections

- Viral epidemiology, molecular aspects of carcinogenesis, mechanisms of chronic 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. Epidemiology, aetiology, pathogenesis and complications Hydatid disease; terminology and classification, aetiology, life cycle development and complications; serological testing.

2.4.2 Acute Liver Failure

- Etiology and pathophysiology, complications and prognosis
- Classifications

2.4.3 Chronic Liver Disease and Portal Hypertension

Etiology, pathogenesis and natural history
Classification (Childs Pugh)
Pathophysiology and complications of portal hypertension
Pathophysiology of ascites

2.4.4 Vascular

- Budd Chiari and venous occlusive disease
Etiology pathophysiology and complications
- Hepatic artery aneurisms and its branches
Etiology and pathology and complications

2.4.5 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

This section implies a knowledge of the basic pathophysiology of neoplasia: This includes mechanisms of carcinogenesis, genetic alterations, mechanisms of chronic inflammation and principles of tumour biology including the metastatic process.

2.4.6 Benign neoplasms: Classification, histology, aetiology and pathogenesis natural history

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

2.4.7 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

2.4.8 Secondary malignancies. Staging, pathogenesis, prognostic variables including molecular markers, natural history

- Colorectal
- Neuroendocrine
- Other secondaries breast, melanoma, renal, other GIT tumours

2.5 Physiology of the Pancreas and Duodenum

2.5.1 Exocrine enzyme physiology –synthesis, excretion and activation

2.5.2 Neural and hormonal influences of exocrine secretion

2.5.3 Endocrine metabolism – islet cell function, neuroendocrine hormones

2.5.4 Mechanisms of pancreatic pain

2.5.5 Regulation of duodenal motility

2.5.6 Neuroendocrine (gut) hormone physiology

2.6 Investigations of the Pancreas and Duodenum

2.6.1 Markers of pancreatic injury

2.6.2 Measurement of exocrine and endocrine pancreatic function

2.6.3 Markers of blood and urinary endocrine hormones

2.6.4 Interpretation of pancreatic tumour markers

2.6.5 Interpretation of biopsy – pancreas, duodenum and ampulla

2.7 Pathology of Pancreas and Duodenum

Non neoplastic

2.7.1 Definition and classification of Pancreatitis

2.7.2 Acute Pancreatitis

- Aetiology and pathogenesis of acute pancreatitis including extrapancreatic organ manifestations
- Assessment of severity
- Hemodynamic, biochemical and metabolic abnormalities
- Pancreatic necrosis: pathogenesis and natural history

2.7.3 Pancreatic fistulas

- Aetiology, pathophysiology and complications

2.7.4 Pancreatic Pseudocysts

- Aetiology, natural history and complications

2.7.5 Pancreatic vascular manifestations

- Haemorrhage thrombosis

2.7.6 Pancreatic Infections

- Pancreatic abscess
- Fungal infections
- TB

2.7.7 Chronic Pancreatitis

- Aetiology, pathophysiology natural history

- 2.7.8 Congenital anomalies of the pancreas and pancreatic duct
- Pancreatic Divisum
 - Annular pancreas
 - Von Hippel

Neoplastic conditions of the Pancreas and Duodenum

- 2.7.9 Benign Cysts and Neoplasms of the Pancreas: A detailed knowledge of the classification, aetiology, pathogenesis, histology and natural history is required of the following conditions:
- Microcystic serous adenoma
 - Mucinous cystic neoplasm
 - IPMN
 - Solid pseudopapillary tumours
 - Neuroendocrine tumours
- 2.7.10 Malignant Tumours of the Pancreas - Histological classification
- Primary adenocarcinoma: Epidemiology and risk factors; Pathogenesis - genetics and molecular biology, pathology and patterns of spread; Staging classification
 - Metastatic disease to the pancreas-renal cell, melanoma, colorectal
 - Lymphoma pancreas
 - Endocrine tumours of the pancreas – classification and pathogenesis
- 2.7.11 Ampullary and duodenal tumours
- Staging and histological classification
 - Epidemiology, risk factors, pathogenesis and association with other diseases
 - Patterns of spread and natural history
- 2.7.12 Pancreatic and duodenal injuries
- Epidemiology, pathophysiology and mechanisms of injury
 - Classification

2.8 Physiology of the spleen

- 2.8.1 Immune and haematological function of the spleen
- 2.8.2 Interpretation of tests of immune spleen function

2.9 Pathology of the spleen

- 2.9.1 Etiology and pathogenesis of hypersplenism
- 2.9.2 Etiology, pathophysiology and prognosis of hyposplenism including OPSI
- 2.9.3 Splenic Infarct and abscesses
- 2.9.4 Parasitic Infections of the spleen including Hydatid disease

- 2.9.5 Splenic Tumours: Etiology, pathology and natural history
- Benign: splenic cysts
 - Malignant: lymphoproliferative disorders, sarcoma, hemangiothelioma
- 2.9.6 Vascular: Etiology, pathophysiology and complications
- splenic vein thrombosis
 - splenic artery aneurism

MODULE III

PERIOPERATIVE CARE

This module will consist of 3 subunits. These include: (a) General principles in the perioperative care of patients with HPB disorders, (b) Principles of Imaging (c) Principles of Oncology.

Subunit I

GENERAL PRINCIPLES

Objectives

During this module the fellow should learn the following concepts:

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.

Content

- 1.1 Demonstrate a detailed knowledge of the impact of comorbidities and other risk factors on the impact of management of HPB disease.
 - 1.1.1 Evaluation of the high risk patient in HPB surgery - correlation of ASA and APACHE scores with operative morbidity and mortality in HPB disorders.
 - 1.1.2 Prognostic effect of obstructive jaundice on perioperative morbidity and measures to minimise these effects.
 - 1.1.3 The impact of renal failure on the jaundiced patient and strategies to minimise these effects.
The impact of cirrhosis and portal hypertension, Childs Pugh score on non shunt surgery.
Disorders of coagulation and management.
Minimising the impact of diabetes and cardiorespiratory disorders on HPB surgery.
- 1.2 Perioperative complications and critical care management in patients with complex HPB disorders including:
 - 1.2.1 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 embolisation.
 - 1.2.2 Prophylaxis against common complications.
 - Understanding of DVT prophylaxis and treatment.
 - Measures to prevent sepsis.
 - 1.2.3 Neuroendocrine hormonal blockade.
 - 1.2.4 Detailed operative plan based on preoperative Imaging.
- 1.3 Management of complications.
- 1.3.1 Liver failure, encephalopathy.
 - 1.3.2 Bleeding and coagulation disorders.
 - 1.3.3 Vessel occlusion syndromes: hepatic artery, portal vein hepatic veins.
 - 1.3.4 Biliary, pancreatic and enteric fistula and abdominal collections.
- 1.4 Sepsis
- 1.4.1 Acquire a detailed knowledge of the various syndrome of systemic sepsis and its management including multi organ failure and supportive therapy.
 - 1.4.2 Management of abdominal collections and abscesses.
Radiological percutaneous techniques for abdominal collections: indications and outcomes.
 - 1.4.3 Approaches to peritoneal sepsis.
 - 1.4.4 Knowledge of the spectrum of organisms involved in sepsis associated with HPB diseases.
 - 1.4.5 Knowledge of common antibiotics used in the treatment of HPB sepsis including indications and toxicity.
 - 1.4.6 Gut enteric organisms - translocation and pathogenesis in HPB sepsis.
Selective bowel decontamination.
- 1.5 Nutrition
- 1.5.1 Nutritional assessment: identification of malnutrition and nutritional risk factors.
 - 1.5.2 Specific metabolic and nutritional problems associated with HPB.
Disease: jaundice, pancreatic insufficiency, pancreatic sepsis.
 - 1.5.3 Alterations in metabolism following major hepatic or pancreatic resection.
 - 1.5.4 Indications and timing for perioperative nutrition enteral or parenteral.
Methods of administration: jejunostomy, nasoenteric, parenteral.
 - 1.5.5 The role of preoperative nutrition in malignancy, obstructive jaundice and pancreatitis.
Principles of dietary immunomodulation.
Basic understanding of calorific requirements and protocols in nutrition.
 - 1.5.6 Complications of parenteral and enteral nutrition.

Subunit II

IMAGING

1. Objectives

Upon completion of this unit, the Fellow will:

- 1.1 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.
- 1.2 Understand the relative advantages, disadvantages and indications of each modality.
- 1.3 Interpret the detailed information provided by the imaging of the liver biliary tract, pancreas duodenum and spleen to the clinical situation.
- 1.4 Perform and interpret intraoperative ultrasound.

2. Content

- 2.1 The applied physics and technology of Ultrasound, Doppler, CT scan, MRI scan, PET Scan, radionuclide Liver Spleen Scan and other nuclear medicine imaging procedures.
- 2.2 The interpretation of images and application to clinical investigation.
- 2.3 Imaging algorithm for the investigation of hepatobiliary, pancreatic and splenic disorders including:
 - 2.3.1 Cystics lesions of the liver, pancreas and spleen.
 - 2.3.2 Non cystic lesions of the liver, pancreas and spleen.
 - 2.3.3 Biliary dilatation and /or jaundice.
 - 2.3.4 Periapillary tumours.
 - 2.3.5 Biliary strictures.
 - 2.3.6 Gallstones including biliary and gallbladder dyskinesia.
 - 2.3.7 Pancreatitis and pancreatic inflammatory lesions.

3. Clinical Skills

- 3.1 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.
- 3.2 Interpret images to correctly identify normal structure, anomalies and pathological abnormalities.
- 3.3 Integrate the findings of the various images with the clinical situation.
- 3.4 Perform and interpret intra operative ultrasound.

Subunit III

ONCOLOGY

Objectives

- 1.1.1 Understand the mechanisms of action of the classes of chemotherapeutic agents currently available for HBP malignancies.
- 1.1.2 Understand the physics, mechanism of action and technology of radiation therapy.
- 1.1.3 Apply this understanding to the multidisciplinary management of HBP malignancies.
- 1.1.4 **Chemotherapy**
Knowledge should include:
 - (1) Classes of drugs
 - (2) Mechanisms of action
 - (3) Toxicities
 - (4) Combination therapy and available protocols
- 1.1.5 **Radiation therapy**
 - (1) Applied physics and technology
 - (2) Mechanism of action
 - (3) Toxicity
 - (4) Combination protocols with chemotherapy
- 1.1.6 **Multidisciplinary management**
- 1.1.7 **Relative roles of surgery, ablation, chemotherapy and radiation therapy as:**
 - (a) Definitive management
 - (b) Neo- and adjuvant therapy
 - (c) Therapy for recurrent disease
 - (d) Palliative therapy
- 1.1.8 **Clinical Skills**
 - (a) Apply knowledge of tumor biology, chemotherapy and radiation therapy to recommend an appropriate treatment strategy for the management of individual HBP malignancies.
 - (b) Participate regularly in multidisciplinary tumor review conferences.
 - (c) Interact with interventional Radiologists, Medical Oncologists, Radiation Oncologists, Oncology Nurses and Allied Health Professionals, Palliative Care Physicians and Nurses.

MODULE IV

CLINICAL

Objectives:

Upon completion of this unit the fellow will understand:

- The pathophysiology, presentation and natural history of disorders of the liver bile ducts pancreas and spleen.
- The investigative procedures available to efficiently diagnose the disease.
- 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.

Optional: Advanced laparoscopic workshop(s) in HPB surgery.

Assessment: Continuous, Exit examination

Subunit I

BILIARY

Content:

Condition	Clinical Assessment & Diagnostic Evaluation	Management Principles	Techniques
<p>Biliary Calculi</p> <p>Biliary colic/ chronic cholecystitis</p> <ul style="list-style-type: none"> - Empyema/mucocoele - Mirrizzis syndrome - Acalculous cholecystitis - Gallbladder dyskinesia 	<p>Describe and differentiate the clinical features of these conditions</p> <p>Describe the appropriate imaging and biochemical investigations to define and differentiate these conditions</p> <p>Describe the relative risks of these conditions with associated comorbidities eg portal hypertension</p> <p>Detailed knowledge of operative and postoperative complications of cholecystectomy</p> <p>Detailed knowledge of outcomes following various treatment options including QOL</p>	<p>Describe and evaluate the management of these conditions, including asymptomatic gallstones. This should include:</p> <p>A detailed knowledge of appropriate antibiotics and the management of sepsis</p> <p>Indications and options of conservative management, percutaneous, minimally invasive and open surgical techniques</p>	<ul style="list-style-type: none"> - Laparoscopic cholecystectomy - Operative cholangiogram - Technical options for the difficult cholecystectomy - Open cholecystectomy - Percutaneous cholecystotomy

Condition	Clinical Assessment & Diagnostic Evaluation	Management Principles	Technique
<p>Common duct stones</p> <p>Acute suppurative Cholangitis</p>	<p>Describe the clinical features and various presentations of obstructive jaundice and ascending cholangitis</p> <p>Determine the optimum imaging techniques to detect CBD stones comparison and limitations</p>	<p>Detailed knowledge of the management of suppurative cholangitis including optimum antibiotic and supportive therapy</p> <p>Detailed knowledge of various techniques of interventional access to CBD with outcomes</p> <p>Timing and optimum techniques for combined treatment of CBD stones and cholecystolithiasis</p>	<p>Open exploration of CBD including choledochoscopy, insertion of T tube, choledochoduodenostomy and sphincteroplasty</p> <p>Laparoscopic exploration of CBD including flushing, basket retrieval, choledochotomy and insertion of stents</p> <p>Radiological/endoscopic techniques and/or combination with surgery</p>
<p>Intrahepatic Stones</p>	<p>Describe the clinical presentation of this condition</p> <p>Have a detailed knowledge of the optimum imaging techniques in characterising and staging this disease</p> <p>Staging classification</p>	<p>Detailed knowledge of indications and options of management including sepsis and biliary obstruction</p> <p>Knowledge of follow up protocols, complications and outcomes</p>	<p>Percutaneous and endoscopic options for emergency and elective situations</p> <p>Techniques of choledoscopy, balloon dilatation, biopsy for intrahepatic strictures</p> <p>Biliary and liver resection Enterobiliary anastomosis Biliary access loops, stents</p>
<p>Benign Biliary Strictures - Cholecystectomy related biliary injuries</p>	<p>Detailed knowledge of clinical presentation, classification and mechanisms of injury</p> <p>Optimum imaging techniques to define nature of biliary injury and other associated vascular or enteric injuries</p>	<p>Recognition of bile duct injuries operative and postoperative</p> <p>Appreciation of appropriate options (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.</p>	<p>Bilio enterostomy with construction of Roux en y limb Access loops Duct-duct anastomosis Biliary stenting and dilatation via ERCP or PTC</p>
<p>- Primary sclerosing cholangitis - Idiopathic-inflammatory - Post traumatic</p>	<p>Detailed knowledge of clinical presentation, disease association, and complications</p>	<p>Management of PSC Screening and biopsy for cholangiocarcinoma</p> <p>Follow up protocols and detailed knowledge of potential long term complications following repair</p>	<p>PTC or ERCP with stents hepaticoenterostomy Resection Liver transplantation</p>

Condition	Clinical Assessment & Diagnostic Evaluation	Management Principles	Technique
Biliary fistulas - internal - external	<p>Detailed knowledge of the various clinical presentations of internal and external fistulas including Mirizzis syndrome and gallstone ileus</p> <p>An understanding of the optimum imaging techniques to define and characterise these fistulas</p>	<p>Management principles regarding the indications and appropriate techniques (conservative, endoscopic , percutaneous and laparoscopic) options for the treatment of fistulas</p>	<p>The use of stenting techniques by endoscopic or percutaneous methods</p> <p>Techniques of cholecystectomy and common bile duct exploration by laparoscopic or open surgical techniques</p> <p>Bilio enterostomy</p> <p>Bowel resection</p> <p>Enterotomy and closure</p>
Biliary Cystic Disease Choledochal cysts Caroli's disease	<p>Awareness of various modes of clinical presentation, natural history, complications and associated conditions</p> <p>A detailed knowledge of the most appropriate imaging techniques and laboratory tests to define the characteristics and extent and other associated pathology</p>	<p>Management of choledochal cyst based on type and extent of disease'</p> <p>Appreciation of the role of endoscopic and percutaneous techniques in emergency presentations and subsequent appropriate surgical procedures</p> <p>Awareness of follow up protocol and potential complications</p>	<p>Choledochal resection and biliary reconstruction</p> <p>Associated liver and pancreatic resections</p> <p>Liver transplantation</p> <p>Endoscopic stenting</p>
Tumours of the Gallbladder and BT Benign tumours	<p>Awareness of clinical presentation, natural history</p> <p>Knowledge of imaging modalities to distinguish between malignant and benign tumours of the gallbladder</p>	<p>Principles of management including indications for resection and follow up protocols</p>	<p>Principles of resection: - Laparoscopic or open surgical approaches - role of frozen section</p>
Carcinoma of the gallbladder	<p>Awareness of clinical presentation</p> <p>Knowledge of imaging and other investigations to diagnose and stage disease</p> <p>Complications</p>	<p>General principles of perioperative management</p> <p>Indications for curative or palliative procedures and likely outcomes</p> <p>The role of chemotherapy or radiotherapy in a palliative, neoadjuvant or adjuvant role</p> <p>Follow up protocols</p>	<p>Staging laparoscopy and/or biopsy</p> <p>Surgical bypass procedures</p> <p>Percutaneous or endoscopic stenting procedures</p> <p>Radical cholecystectomy, liver resection</p> <p>Lymph node clearance</p> <p>Vascular reconstruction</p>

Condition	Clinical Assessment & Diagnostic Evaluation	Management Principles	Technique
Hilar cholangiocarcinoma	<p>Clinical presentation of hilar cholangiocarcinoma</p> <p>Knowledge of radiology, laparoscopy and biochemical tests to assess and stage disease</p> <p>Staging classification complications</p>	<p>Peri operative issues and management of the jaundiced patient including indications for biliary decompression</p> <p>Atrophy and PV embolisation</p> <p>Indications and suitability for resection</p> <p>The role of chemo/radiotherapy as neo/adjuvant or palliative setting</p> <p>Follow up protocols QOL</p>	<p>Staging laparoscopy and/or bypass</p> <p>Endoscopic or transhepatic stenting</p> <p>Intrahepatic bypass procedures</p> <p>Radical Biliary resection and reconstruction</p> <p>Liver resection including caudate vascular reconstruction</p> <p>Lymph node clearance</p>

Operative skills required:

1. Insertion of ports or abdominal wall incisions appropriate for the intended procedure
2. Staging laparoscopy and biopsy
3. Intra operative ultrasound and intraoperative cholangiography, choledochoscopy
4. Laparoscopic and open cholecystectomy, subtotal cholecystotomy, radical cholecystectomy and
5. Portal lymph node clearance
6. Vascular and biliary reconstruction techniques
7. Common bile duct exploration (laparoscopic and open) extraction CBD stones: flushing. Instrument removal, basket extraction. Insertion of stents and T tubes
8. Sphincteroplasty and choledochoduodenostomy/enterostomy
9. Whipples procedure, portal node dissection
10. Liver resection and hepatico enterostomy with access loop
11. Biliary duct reconstruction
12. Duct to duct anastomosis
13. Intrahepatic cholangioenterostomy : right and left lobes
14. Duodenal exclusion procedures

Subunit II

DUODENUM, PANCREAS AND SPLEEN

Condition	Clinical Assessment & Diagnostic Evaluation	Management Principles	Technique
<p>Pancreatitis</p> <p>Acute Pancreatitis</p>	<p>Classification of pancreatitis</p> <p>Various modes of clinical presentation</p> <p>Radiological biochemical and haematological tests for diagnosis, aetiological factors and assessment of severity and prognosis</p> <p>Diagnostic tests to define complications including pancreatic infection</p>	<p>Management principles of acute pancreatitis and its complications including : use of antibiotics nutrition and septic complications</p> <p>Supportive and critical care principles</p> <p>Indications for endoscopic and surgical intervention</p> <p>Organ failure and SIRS</p>	<p>Operative recognition of acute pancreatitis laparoscopic cholecystectomy in acute gallstone pancreatitis</p> <p>Intervention therapy using endoscopic, arteriographic and laparoscopic techniques</p> <p>Necrosectomy including open, laparoscopic, endoscopic and percutaneous techniques</p> <p>Pseudo cyst gastrostomy/enterostomy surgical approaches to haemorrhage, perforations, gastric outlet obstruction</p> <p>Feeding jejunostomy, Peritoneal lavage</p>
<p>Chronic Pancreatitis including autoimmune pancreatitis</p> <p>Inflammatory mass head of pancreas</p>	<p>Clinical presentation</p> <p>Imaging, biochemical haematological and immunological tests to diagnose and characterise the disease</p> <p>Assessment and diagnosis of complications</p>	<p>Management principles including decision making in the indications for conservative, endoscopic or surgical management</p> <p>Strategies to diagnosis and manage the inflammatory pancreatic mass</p>	<p>Endoscopic stenting of main or accessory pancreatic duct and CBD</p> <p>ESWL/Endoscopic lithotripsy for stones</p> <p>Laparoscopic and open pseudocyst drainage procedures</p> <p>Pancreatic sphincteroplasty to main or accessory pancreatic ducts</p> <p>lateral pancreaticojejunostomy Freys or Begers procedures</p> <p>total pancreatectomy Whipples, distal pancreatectomy, central pancreatectomy</p> <p>Pseudocyst gastro enterostomy</p> <p>Denervation procedures, coeliac axis block</p>
Pancreatic Divisum	Clinical significance and methods of presentation and natural history	Indications and options of treatment including conservative, endoscopic and surgical techniques	Accessory papilla sphincteroplasty Pancreatico jejunostomy Pancreatic resection

Condition	Clinical Assessment & Diagnostic Evaluation	Management Principles	Technique
Pancreatic Fistulas and ascites	Classification Clinical presentation(s) Imaging techniques to diagnose and characterise 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 Pancreaticoenteric bypass techniques Pancreatic resection
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	ERCP Endoscopic insertion pancreatic stents Endoscopic cyst gastrostomy Radiological percutaneous drainage Radiological cystgastrostomy Surgical pseudocyst enterostomy/gastrostomy Pancreatic resection
Pancreatic Haemorrhage	Clinical presentation Appraisal of diagnostic tests to diagnose and characterise site of bleeding following acute pancreatitis or post operative pancreatic resection	Management of bleeding including algorithm of plan of management. Options of endoscopic , arteriographic and surgical techniques with knowledge of outcomes and prognosis	Angiography and embolisation Surgical techniques
Portal and splenic vein thrombosis	Clinical presentation and radiological assessment and characterisation (US, duplex, CT MRI angiography and portography)	Options of conservative, radiological (embolic) and surgical treatment of bleeding varices secondary to PV and splenic vein thrombosis	Techniques for bleeding varices: Schlerotherapy, balloon tamponade embolisation Emergency splenectomy Local devascularisation procedures
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	A detailed knowledge of the significance, clinical presentations and natural history of these conditions Radiological techniques to diagnose and characterise these abnormalities	Significance of the anomalies and Indications for intervention Other pathological conditions with the various anomalies	Duodeno-duodenostomy Pancreatic stenting Sphincteroplasty

Condition	Clinical Assessment & Diagnostic Evaluation	Management Principles	Technique
<p>Pancreatic duodenal trauma</p> <p>Endoscopic complications Haemorrhage, perforation, sepsis and acute pancreatitis</p>	<p>Classification and staging</p> <p>Modes of clinical presentation and mechanisms of injury</p> <p>Radiological, hematological and biochemical tests for diagnosis and definition of injury</p> <p>Knowledge of complications and natural history</p>	<p>Management of pancreatic trauma with options of conservative endoscopic or surgical (open or laparoscopic) techniques</p> <p>Follow up</p>	<p>Endoscopic stenting</p> <p>Radiological drainage</p> <p>Surgical techniques:</p> <ul style="list-style-type: none"> - triple tube decompression - pyloric exclusion procedures - Drainage <p>Operative assessment of pancreatic duct injury</p> <p>Distal pancreatectomy (spleen preserving)</p> <p>Internal drainage</p> <p>pancreaticojejunostomy</p> <p>Whipples</p>
<p>Neoplastic Conditions</p> <p>Benign cysts and neoplasms</p> <p>Serous, mucinous cyst adenoma</p> <p>IPMN</p> <p>Cystic pancreatic incidentaloma</p>	<p>Classification and differentiation from pseudocyst and duodenal diverticulum</p> <p>Clinical presentations of cystic pancreatic tumours and differential diagnosis</p> <p>A detailed assessment of radiological (CT, US MRI) cytological, biochemical molecular markers to differentiate between benign, premalignant and malignant cystic tumours of the pancreas</p> <p>Role of endoscopic ultrasound</p>	<p>Management protocol including indications of conservative therapy or intervention</p> <p>Follow up protocols</p>	<p>Laposcopic and /or open surgical techniques for pancreatic cystic tumours</p> <p>Local enucleation techniques</p> <p>Pancreatic resection: Whipples, central pancreatectomy, spleen preserving distal pancreatectomy,</p>
<p>Malignant tumours</p> <p>Primary :Pancreatic adenocarcinoma</p>	<p>Staging</p> <p>Clinical presentation</p> <p>Radiological and other tests to diagnose and stage the disease</p>	<p>Nutritional support</p> <p>Indications for biliary decompression</p> <p>Indications of resectability</p> <p>Indications for biopsy</p> <p>Choosing appropriate resection technique</p> <p>Role of neo/adjuvant therapy chemotherapy</p> <p>Follow up protocols including quality of life assessment</p>	<p>Staging laparoscopy, intraoperative ultrasound</p> <p>Palliative options: Gastrojejunostomy Hepatojejunostomy by laparoscopic or open surgical techniques</p> <p>Duodenal stenting, CBD and pancreatic stenting</p> <p>Nerve ablation techniques</p> <p>Pancreatic resection: Whipples, distal pancreatectomy, central pancreatectomy, total pancreatectomy</p>

Condition	Clinical Assessment & Diagnostic Evaluation	Management Principles	Technique
		<p>Palliative options of endoscopic, radiological or surgical techniques for pain, gastric outlet obstruction, jaundice</p> <p>Knowledge of outcomes of these procedures including long term survival and complications</p> <p>Management of post operative complications</p>	<p>Portal vein resection and vascular reconstruction</p>
<p>Pancreatic lymphoma Pancreatic metastases: Renal, melanoma colorectal</p> <p>Pancreatic incidentaloma</p>	<p>Clinical presentation</p> <p>Radiological and haematological tests to diagnose and stage disease</p>	<p>Management plan of the pancreatic incidentaloma</p> <p>Management plan regarding conservative or interventional treatment for pancreatic lymphoma and metastases</p>	
<p>Duodenal and Ampullary tumours</p>	<p>Staging, classification and associated syndromes</p> <p>Clinical presentation</p> <p>Imaging techniques including the role of EUS and biopsy</p>	<p>Management options including conservative, curative or palliative strategies</p> <p>Screening and surveillance in FAP FAP follow up</p> <p>Chemo preventative therapy</p> <p>Indications for biliary decompression</p>	<p>ERCP Palliative endoscopic or radiological decompression</p> <p>Laser, argon ablation of duodenal polyps, tumours</p> <p>Local transduodenal resection by endoscopic, laparoscopic and surgical techniques</p> <p>Pancreatic preserving duodenectomy Whipples</p>
<p>Endocrine tumours of the pancreas including adult nesiodiobalastosis</p>	<p>Classification</p> <p>Presentation and differential diagnosis of various syndromes from secreting tumours</p> <p>MEA syndromes</p> <p>Radiological hormone assays and other tests to detect and stage</p>	<p>Options of management including conservative, medical, resection by laparoscopic and open techniques</p> <p>Knowledge of medical therapy including suppression and chemotherapy</p> <p>Antisecretory medication Management of metastatic disease chemotherapy, focal ablative, SIRT, resection, HAA embolisation</p>	<p>Laparoscopy, intraoperative ultrasound</p> <p>Techniques of localisation at operation including intraoperative US, monitoring protocols of blood sugar, venous sampling Techniques to differentiate malignant and benign disease</p> <p>Pancreatic resection : Enucleation central pancreatectomy, distal pancreatectomy (spleen preservation). Whipples procedure</p>

Condition	Clinical Assessment & Diagnostic Evaluation	Management Principles	Technique
Spleen Splenic Trauma	Staging of splenic trauma Mechanisms of injury Clinical presentation Radiological investigations to diagnose, stage splenic injury as well as other injuries Complications and natural history of splenic trauma Detailed knowledge of acute and long term complications of splenectomy	Management principle of splenic trauma including the indications of conservative , radiological (angiography) and open surgical intervention The complications and relative merits of these techniques Management of the complications of splenic trauma including long term management and follow up of OPSI	Assessment of splenic trauma at laparotomy Total splenectomy Splenorrhaphy
Splenic tumours- Primary and secondary Cystic and solid Haematological and infections involvement of spleen	Clinical presentation Radiological investigation to differentiate the pathological nature Knowledge of complications of splenectomy		Splenectomy Techniques of splenectomy for massive spleen
Splenic Artery Aneurisms	Clinical presentation Radiological Tests	Managements Principle including conservative, Radiological and surgery	Occlusive techniques

Operative Skills

1. Abdominal incisions and placement of ports for appropriate procedure
2. Placement of and types of drains; principles of sump drainage and peritoneal lavage
3. Intraoperative ultrasound and laparoscopic staging of pancreatic tumours
4. Duodenotomy and identification of the main and accessory papilla and pancreatic ducts at operation
5. Kocherisation of the duodenum
6. Local excision of ampullary and duodenal tumours
7. Pancreatic necrosectomy by open, laparoscopic and percutaneous techniques
8. Insertion of feeding jejunostomy
9. Pancreatic gastrostomy/enterostomy
10. Distal pancreatectomy including splenic preserving
11. Pancreatic tumour enucleation
12. Central pancreatectomy
13. Pancreatico duodenectomy including pyloric preserving
14. Total pancreatectomy
15. Retroperitoneal node dissection
16. Pseudocyst enterostomy/gastrostomy
17. Puestows procedure and modifications
18. Duodenal preserving pancreatectomy
19. Resection techniques for chronic pancreatitis: Freys, Begers
20. Coeliac axis injection or ablation
21. Splenectomy for trauma
22. Splenorrhaphy
23. Splenectomy for massive spleens, portal hypertension and tumours
24. Ligation of splenic artery aneurisms

Subunit III

LIVER

Content

Condition	Clinical Assessment & Diagnostic Evaluation	Management Principles	Technique
Liver Failure Acute Liver Failure	Classification system including Kings College Criteria Presentation, natural history and prognostic factors Investigations to diagnose, define aetiology 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 - OLT and axillary
Chronic liver failure - Viral hepatitis - Alcoholic liver disease - NASH - Autoimmune disease - Primary Biliary cirrhosis - PSC - Wilsons - 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	Laparoscopy Liver biopsy by laparoscopy, percutaneous, open and transjugular routes Modified surgical techniques in patients with cirrhosis undergoing non liver or shunt surgery
Ascites	Clinical presentation Investigations to confirm ascites, including tests to differentiate ascites from liver, lymphatics 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	Laparoscopy and biopsy Percutaneous aspiration of ascites under US control TIPS and peritoneo venous shunt Decompressive surgical shunts Liver transplantation Surgical techniques in patients with ascites undergoing surgery such as abdominal wall hernias etc
Portal hypertension - Budd Chiari	Clinical presentations Investigations (radiology hematology biochemistry) to diagnose, define aetiology and	Indications for portal decompression - Non operative strategies and medical management	Esophageal sclerotherapy and banding Variceal embolisation TIPS

Condition	Clinical Assessment & Diagnostic Evaluation	Management Principles	Technique
	<p>characterise the anatomy of portal hypertension, including sites of variceal bleeding</p> <p>Prognosis and complications</p>	<p>- The indications and outcomes of endoscopic and radiological techniques</p> <p>- Laparoscopic and surgical techniques</p> <p>- Indications for liver transplantation</p> <p>- Risks and benefits of TIPS and surgical shunts for PHT</p>	<p>Shunt surgery: portacaval, splenorenal, mesocaval and variants</p> <p>Local devascularisation procedures</p> <p>Surgical techniques in patients undergoing non shunt surgery with portal hypertension eg cholecystectomy, hernias</p>
<p>Liver Infections</p> <p>Pyogenic and fungal liver abscesses</p> <p>Other liver abscesses including amoebic abscess and TB</p>	<p>Clinical presentation</p> <p>Investigations to diagnose, evaluate and identify possible sources and organisms</p>	<p>Management of liver abscesses including conservative, percutaneous endoscopic, and surgical options</p> <p>Detailed knowledge of organisms, appropriate antibiotic therapy and length of therapy</p> <p>Indication for biliary tract imaging and decompression</p> <p>Indications for surgical options</p>	<p>Percutaneous, Laparoscopic and open surgical drainage of liver abscesses</p>
<p>Hydatid Liver Disease</p>	<p>Classification, epidemiology and staging</p> <p>Modes of clinical presentation</p> <p>Radiological and serological investigation for detection and complications</p> <p>Detailed knowledge of specificity and sensitivity of serological tests for diagnosis and follow up</p> <p>Knowledge of complications and natural history</p>	<p>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</p> <p>Surgical options including surgical, radiological and endoscopic</p> <p>Complications including peritoneal rupture and dissemination, Biliary tract involvement including rupture, Biliary bronchial/peritoneal fistulas</p> <p>Follow up</p>	<p>ERCP and spincterotomy</p> <p>Radiological techniques of aspiration and instillation of chemotherapy</p> <p>Laparoscopic and open surgical techniques including pericystectomy, endocystectomy</p> <p>Omental pedicle</p> <p>Liver resection</p> <p>CBD exploration</p>
<p>Liver trauma</p> <p>Blunt and penetrating</p>	<p>Classification</p> <p>Mechanisms of injury</p> <p>Clinical presentation(s)</p> <p>Investigations to define extent of injury and other injuries</p> <p>Complications</p> <p>Prognosis</p>	<p>Overall management principles and triage of liver trauma.</p> <p>Indications for operative or non operative management</p> <p>Principles of management of resuscitation, sepsis, coagulation and multi organ support</p> <p>Assessment of the options of minimally invasive or open surgical intervention</p> <p>Role of laparoscopic, endoscopic and radiological invasive techniques</p>	<p>Role of radiological – embolisation, vascular stenting percutaneous techniques</p> <p>ERCP and biliary stents including timing and role</p> <p>Laparoscopy and liver debridement and drainage of sepsis including timing</p> <p>Operative assessment of abdominal injuries</p> <p>Liver packing, lacerations, debridement, omental pedicle</p> <p>Vascular injuries and repair</p>

Condition	Clinical Assessment & Diagnostic Evaluation	Management Principles	Technique
others	staging Tumour and molecular markers Complications following liver resection natural history Nomenclature for liver resections	Indications for resection Evaluate the co-morbidities of patients for liver resection 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 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 Diagnose and treat complications following liver resection Follow up protocols of patients following resection for CRC liver metastases. MDT interactions	IOUS Liver resections using different approaches and techniques: subsegmental, segmental, lobar, extended Two stage hepatectomy, ex situ surgery, total vascular exclusion Insertion of vascular infusion devices

Skills for Liver Surgery

1. Perform liver resections using a variety of approaches and transection techniques
2. Place abdominal incisions and ports for intended procedure
3. Staging laparoscopy, liver biopsy - assessment of respectability at laparoscopy or laparotomy
4. Types of liver resection (Nomenclature of liver resection using Brisbane system)
 - a. Laparoscopic, laparoscopic-assisted, open laparotomy
 - b. Non anatomic, segmental, lobectomy, extended lobectomy
 - c. Staged resections
 - d. Combination with ablation
 - e. Vascular control: none, Pringle maneuver, total vascular isolation, VVP
 - f. Vascular resection and reconstruction
 - g. Various parenchymal transection techniques
 - h. Modified techniques for fatty, fibrotic and cirrhotic parenchyma
 - i. Concomitant resection of IVC, diaphragm, portal vein and bile duct
 - j. Extrahepatic nodal clearance

MODULE V

EDUCATION AND RESEARCH

Clinical research must be included in the clinical program. HPB fellows must meet the following research requirements as part of the fellowship:

- a. Have published or accepted for publication an article in an international peer reviewed journal (not case report/abstract)
- b. Presented at a national or international forum (not a poster)
- c. Should carry out or participate in a research project

Laboratory research or enrolment in a higher degree is optional and will not replace any time in the clinical fellowship. In addition, the fellow should have:

1. Knowledge of the design and implementation of a prospective data base
2. Knowledge of the principles of evidence based medicine
3. Knowledge of the design and conduct of prospective clinical trials
4. Knowledge of the process of translational research
5. Knowledge of statistical methods to properly evaluate the results of published research studies
6. Knowledge and skills to train students and residents in the multidisciplinary management of HPB patients
7. Skills to organize and conduct HPB related public education programs