Hepatobiliary and Pancreatic Surgery

General Objectives

1. Demonstrate knowledge of the anatomy, physiology, and pathophysiology of the liver, biliary tract, and pancreas.

A. Medical Expert/Clinical Decision Maker

A.1 Knowledge: Basic Science and Anatomy

1. Demonstrate knowledge of the anatomy, physiology and pathophysiology of the liver, biliary tract and pancreas.

Junior Level

Liver and Biliary Tract

1. Describe the anatomy of the liver, biliary system, and pancreas including commonly found variations.

2. Describe the physiology and function of liver, biliary system, and pancreas to include:
   a. Glucose metabolism
   b. Protein synthesis
   c. Coagulation
   d. Drug metabolism
   e. Reticuloendothelial system
   f. Function of bile in fat metabolism

3. Explain the formation of bile, its composition, its function in digestion and its metabolism.

4. Describe the pathophysiology of gallstone formation.

Pancreas

1. Describe the anatomy of the pancreas, including regional vascular anatomy.

2. Discuss the physiology of the pancreas, including endocrine and exocrine function and hormonal regulation.
   a. Endocrine
      i. islet cells
         1. Alpha (Glucagon)
         2. Beta (Insulin)
         3. Delta (Somatostatin)
         4. Non-Beta (pancreatic polypeptide)
   b. Exocrine
      i. acinar cells
         1. Lipase
2. Amylase
c. Hormonal regulation
   i. Secretin-bicarbonate secretion
   ii. Cholecystokinin–enzyme secretion

A.2 Knowledge: General Clinical

1. Demonstrate the ability to manage disease and injury of the liver, biliary tract and pancreas amenable including the role for surgical and nonsurgical interventions.

Junior Level

Liver and Biliary Tract

1. Perform history and physical examination specifically focused on liver and biliary system.
2. Select and interpret appropriate laboratory and radiological evaluations in the work up of the jaundiced patient

Pancreas

1. Perform history and physical examination focused on the pancreas.
2. Select and interpret appropriate laboratory and radiological examinations in evaluation of pancreatic disease, including:

Senior Level

Liver and Biliary Tract

1. Perform detailed evaluation of patients with liver and biliary disease and plan appropriate management and operative approach.

Pancreas

1. Perform detailed evaluation of patients with pancreatic disease and plan appropriate medical or surgical management.

Chief Level

Liver and Biliary Tract

1. Coordinate overall care of patients with hepatobiliary disease including:
   a. Initial evaluation
   b. Appropriate diagnostic studies
   c. Indicated consultations
Pancreas

1. Coordinate overall care of patients with complex pancreatic disease, including initial evaluation, appropriate diagnostic studies, operative intervention and postop care

A.3 Knowledge: Specific Clinical Problems

Junior Level

Liver and Biliary Tract

1. Outline the work-up and differential diagnosis of the jaundiced patient.
2. Discuss various types of liver cysts and the appropriate management of each.
3. Discuss the pathophysiology and treatment of the following:
   a. Mass lesions of the liver (benign and malignant tumors of the liver, metastatic lesions to the liver)
   b. Congenital anomalies of the liver, bile ducts, and pancreas i.e. Congenital biliary atresia, choledochal cysts, caroli’s disease
   c. Biliary lithiasis and its complications (gallstone ileus, gallstone pancreatitis)
   d. Infections (pyogenic and amebic hepatic abscesses)
   e. Hepatitis, viral and non-viral
   f. Acalculous cholecystitis
   g. Biliary motility problems
   h. Acute and chronic pancreatitis and their complications
      i. Pancreatic neoplasms
      j. Sclerosing cholangitis
   k. Primary biliary cirrhosis
   l. Secondary biliary cirrhosis
   m. Benign biliary strictures

Pancreas

1. Explain the pathophysiology of pancreatitis to include:
   a. Common etiologies such as:
      i. Gallstones
      ii. Alcohol related
      iii. Trauma
      iv. Steroid-induced
      v. Postoperative
      vi. Post endoscopic retrograde cholangiopancreatography (ERCP)
      vii. Idiopathic
   b. Diagnosis, evaluation and medical management
   c. Role of peritoneal lavage
2. Complications of pancreatitis, such as:
   a. Adult respiratory distress syndrome
   b. Hypovolemia
c. Pseudocyst
d. Abscess
e. Infected pancreatic necrosis

3. Indications for operative management of pancreatitis
4. Management of gallstone pancreatitis with timing of surgery
5. Ranson’s criteria for assessing pancreatitis and its correlation with prognosis
6. Explain the pathophysiology of carcinoma of the pancreas to include:
   a. Typical history and presentation
   b. Diagnostic evaluation using:
      i. Computed axial tomography
      ii. Ultrasound
      iii. ERCP
      iv. Percutaneous transhepatic cholangiography (PTC)
      v. Arteriography
      vi. Laparoscopy/laparotomy

7. Indications for:
   a. Operative versus nonoperative biliary drainage
   b. Percutaneous versus endoscopic stenting
   c. Resection
   d. Concomitant gastrojejunostomy with operative biliary bypass
   e. Discuss presentation, evaluation and management of pancreatic pseudocysts
      with attention to:
   f. Complications of pseudocysts (hemorrhage, infection, rupture)
   g. Timing of drainage
   h. Percutaneous versus surgical drainage
   i. Indications for external versus internal drainage
   j. Choice of internal drainage procedure
   k. Explain the diagnosis and management of pancreatic ascites.

Senior Level

Liver and Biliary Tract

1. Pathophysiology and management of
2. Cirrhosis and portal hypertension including management alternatives for complications
3. Various etiologies of cirrhosis (alcohol and hepatitis)
4. Differential diagnosis of portal hypertension (prehepatic, hepatic, posthepatic)
5. Medical management of ascites, encephalopathy and other complications of cirrhosis
7. Perioperative management of the cirrhotic patient
8. Medical management of bleeding esophageal varices using Vasopressin, Sengstaken-Blakemore tube, sclerotherapy and transjugular intrahepatic portosystemic shunts (TIPS)
9. Surgical management of bleeding esophageal varices to include:
a. Selection of operative candidates
b. Appropriate selection of procedures such as:
   i. Selective and nonselective shunts
   ii. Devascularization procedures
   iii. Esophageal transection
10. Surgical management of ascites with peritoneovenous shunts to include patient
    selection and complications
11. Discuss Budd-Chiari Syndrome (pathophysiology and management)
12. Detailed Management of choledocholithiasis
13. alternatives to surgery in the management of gallstones, such as:
    a. Oral dissolution with ursodeoxycolic acid
    b. Extracorporeal shock wave lithotripsy
    c. Endoscopic sphincterotomy
14. Assess management alternatives for common bile duct stones:
    a. Open versus laparoscopic common bile duct exploration
    b. ERCP
15. Indications and outcomes for liver Transplantation
16. Management strategies for chronic pancreatitis

Pancreas

1. Describe the etiology, pathophysiology and management of chronic pancreatitis to
   include:
   a. Indications for operative management
   b. Selection of appropriate operative procedure such as:
      i. Longitudinal pancreaticojejunostomy (Puestow-Gillesby Procedure)
      ii. Caudal pancreaticojejunostomy (Duval Procedure)
      iii. Subtotal pancreatectomy
      iv. Pancreatoduodenectomy
2. Role of celiac ganglion ablation (chemical splanchnicectomy) in pain control
3. Summarize the common sequela of chronic pancreatitis to include pain, fat
   malabsorption and diabetes
4. Discuss diagnosis, evaluation and surgical management of cystic neoplasms of the
   pancreas (mucinous and serous cystadenomas; cystadenocarcinoma).
5. Describe the diagnosis, evaluation and surgical management of the following islet cell
   tumors of the pancreas:
   a. Gastrinoma (Zollinger-Ellison Syndrome)
   b. Blucagonoma
   c. Somatostatinoma
   d. Insulinoma
   e. VIPoma (Verner-Morrison Syndrome, WDHA Syndrome)
6. Describe the diagnosis and management of pancreas divisum.
Chief Level

Liver and Biliary Tract

1. Detail the appropriate surgical management of any selected disorder of the liver or biliary tract.
2. Analyze the technical details of each surgical procedure and options that may be available with pros and cons of each.
3. Summarize the common complications associated with surgical management of liver and biliary tract disease.
4. Summarize the principles of perioperative management of liver and biliary tract disease.

Pancreas

1. Outline the appropriate surgical management of disorders of the pancreas to include:
   a. Pancreatoduodenectomy (Whipple Procedure)
   b. Distal pancreatectomy
   c. Total pancreatectomy
   d. Subtotal (distal 95%) pancreatectomy
   e. Longitudinal pancreaticojejunostomy (Puestow Procedure)
   f. Internal drainage of pseudocysts (cystogastrostomy, cystoduodenostomy, Roux-en-Y cystojejunostomy)
2. Explain the technical details of the above procedures, including the options available and the pros and cons of each.
3. Describe the common complications associated with surgical management of diseases of the pancreas.
4. Summarize the principles of perioperative management of diseases of the pancreas.

A.4 Knowledge: Technical

Junior Level

1. Assist in the perioperative management of patients undergoing hepatobiliary surgery.
2. Assist in perioperative management of patients undergoing pancreatic surgery.
3. Perform uncomplicated hepatobiliary surgery under supervision, such as cholecystectomy, both laparoscopic and open, with operative cholangiography.
4. Assist in more advanced hepatobiliary operations.
5. Perform minor pancreatic procedures under supervision such as external drainage of pseudocyst or internal drainage via cystgastrostomy.

Senior Level

1. Perform, under supervision, increasingly complex hepatobiliary surgery:
   a. Laparoscopic cholecystectomy with cholangiography
   b. Common bile duct exploration with choledochoscopy
c. Biliary drainage procedures, such as:
   i. Choledochoduodenostomy
   ii. Roux-en-Y and loop choledochojejunostomy
   iii. Cholecystojejunostomy

d. Sphincteroplasty

e. Drainage of liver abscess

f. Peritoneovenous shunts

g. Complicated cholecystectomy—acute, gangrenous

h. Simple liver resection

i. Perform increasingly complex pancreatic surgery such as:
   i. Internal drainage of pseudocysts with Roux-en-Y cystjejunostomy
   ii. Longitudinal pancreaticojejunostomy (Puestow Procedure)
   iii. Distal pancreatectomy

j. Biliary bypass for carcinoma

Chief Resident

1. Participate in complex hepatic and biliary surgery including the performance of procedures appropriate for the individual skills and ability
   a. Anatomic liver resection
   b. Portovenous decompression procedures
   c. Complicated procedures on extrahepatic bile ducts for:
      i. Cholangiocarcinoma
      ii. Choledochal cyst
      iii. benign biliary stricture
      iv. Kasai procedure (hepatoportoenterostomy)

2. Supervise and instruct junior house staff in minor hepato-biliary procedures

3. Perform complex pancreatic procedures such as:
   a. Pancreatic resection (i.e. Whipple resection, Total or subtotal pancreatectomy)
   b. Operative debridement and drainage of pancreatic abscess or infected necrosis
   c. Local resection for ampullary tumors

4. Supervise and instruct junior house staff in minor pancreatic procedures.