

**Stanford University General Surgery Residency Program**  
**Minimally Invasive Surgery (MIS) Goals and Objectives for residents: R-1**  
**Rotation Director: James N. Lau, MD**

**Description**

The MIS rotation at Stanford Hospital offers a broad experience in the care of complex patients encompassing bariatric surgery and advanced minimally invasive surgery.

**Goals**

The goal of the MIS rotation is to provide the R-1 house-staff the means to: Gain the knowledge and experience in the inpatient and outpatient evaluation and management of patients with bariatric surgery and advanced minimally invasive surgery.

- Master the principles of perioperative assessment and risk stratification of patients in these categories and others who may be admitted occasionally
- Refine procedural skills commonly required in the care of these patients such as umbilical hernia repair, inguinal hernia repair, laparoscopic cholecystectomy, appendectomy, and *the like*.
- Experience and understand the day-to-day function of a complex inpatient surgical service.

**Objectives**

The rotation has the following objectives:

- The MIS intern will function as a primary team member assuming direct responsibility for care and writing all orders on patients on the service and coordinating care with other services of who may be in a consultative role
- The intern will gain knowledge of surgical care through discussion on rounds with the attending physicians, fellow, and senior residents and also by independent reading
- The intern will participate in daily conferences discussing Morbidity & Mortality conference, Grand Rounds, Core Course, Surgical Preoperative Conference, Gastrointestinal Tumor Board, Digestive Diseases Clinical Conference (DDCC), and the combined Wednesday GI/Surgery conference.
- Interns can expect daily teaching from members of the team, both at the bedside and informal sessions by fellow, senior residents and attendings. Interns will take overnight call as directed by the program and are expected to manage the patients with consultation as needed with the on-call senior resident and either the responsible or on-call attending.

R-1 MIS Service interns are evaluated in the 6 core competencies (Medical knowledge, Patient care, Interpersonal communication skills, Professionalism, Practiced based learning and Systems based practice) using specific web-based evaluation forms. An outline of core competencies with rotation objectives, instructional activities, and evaluations is below.

Specific goals and objectives for residents

GOALS Core Competencies	R-1OBJECTIVES	INSTRUCTIONAL ACTIVITIES	EVALUATION
<p><b>Knowledge:</b> To acquire and apply knowledge of established and evolving basic and applied clinical sciences that relate to the practice of bariatric surgery and advanced minimally invasive surgery.</p>	<ul style="list-style-type: none"> <li>Gain experience in physical examination, diagnostic imaging studies, pre-operative evaluation and risk assessment, peri-procedural management of deep venous thrombosis anticoagulation, and post-operative patient monitoring.</li> <li>Be introduced to ultrasound imaging of gallbladder, GI fluoroscopy, as well as CT and MR imaging of the abdomen and pelvis.</li> </ul>	<p>Teaching by attending faculty, senior residents, and fellows</p> <p>Independent reading</p> <p>Daily Conferences</p> <p>Daily inpatient rounds with an attending surgeon</p>	<p>Weekly feedback by fellow/senior resident/attending and Rotation evaluation by each MIS Surgery attending. Monthly written assessment of knowledge. (<a href="https://stanford.medhub.com">https://stanford.medhub.com</a>)</p>
<p><b>Patient Care:</b> To provide compassionate, appropriate, and effective care to bariatric and minimally invasive surgery patients.</p>	<ul style="list-style-type: none"> <li>Evaluate and manage all inpatient MIS patients in conjunction with a Senior Resident and Attending Surgeon.</li> <li>Perform complete directed history and physical examinations on MIS surgery clinic patients 2-4 days per week depending on volume, review all accompanying clinical and image-based information regarding patients with appropriate resident/faculty supervision</li> </ul>	<p>Twice daily rounds with the MIS Surgery Team and Daily inpatient rounds with an attending surgeon</p>	<p>Weekly feedback by fellow/senior resident/attending and Rotation evaluation by each MIS Surgery attending Monthly written assessment of patient care ability. (<a href="https://stanford.medhub.com">https://stanford.medhub.com</a>)</p>

GOALS Core Competencies	R-1 OBJECTIVES	INSTRUCTIONAL ACTIVITIES	EVALUATION
<p><b>Effective Interpersonal and Communication skills:</b> Interns must communicate in a way that leads to effective information exchange of a bariatric care plan to patients, their families, and professional associates.</p>	<ul style="list-style-type: none"> <li>Instruct medical students on routine floor responsibilities including rounding, patient note writing, orders, computed requisitions, and hospital protocols.</li> <li>Discusses significant peri-operative concerns with team &amp; consultants.</li> <li>Work effectively with nurses to communicate care plan.</li> </ul>	<p>Twice daily rounds with the MIS Surgery Team.</p> <p>Daily inpatient rounds with an attending surgeon.</p>	<p>Weekly feedback by fellow/senior resident/attending and monthly rotation evaluation by each MIS Surgery attending (<a href="https://stanford.medhub.com">https://stanford.medhub.com</a>)</p>
<p><b>Practice based learning and improvement:</b> In order to improve patient care practices, residents must be able to critically evaluate their own performance as well as appraise and incorporate clinical scientific evidence.</p>	<ul style="list-style-type: none"> <li>To become proficient using the Goodman Surgical Simulators for basic general surgery procedures and endoscopies.</li> <li>Identify complications and determine impact on recovery.</li> <li>Use information technology to rapidly assimilate current medical literature as it relates to patient care.</li> </ul>	<p>Twice daily rounds with the MIS Surgery Team and attending surgeon.</p> <p>Daily Conferences.</p>	<p>Weekly feedback by fellow/ senior resident/attending and monthly rotation evaluation by each MIS Surgery attending (<a href="https://stanford.medhub.com">https://stanford.medhub.com</a>)</p>
<p><b>Professionalism:</b> Residents must show a commitment to professional responsibilities, adherence to ethical principles and sensitivity to diversity.</p>	<ul style="list-style-type: none"> <li>Learn to manage complex patient problems specifically related to relaying information to families regarding unexpected outcomes in a quaternary care hospital.</li> <li>Acts with sensitivity and responsiveness to patient's culture, age, gender and disabilities.</li> <li>Maintains accountability to patients, medical profession and society.</li> <li>Obtains proper consent and confirm advanced directives, if present.</li> </ul>	<p>Twice daily rounds with the MIS Surgery Team and attending surgeon.</p> <p>Daily conferences such as GI Conference that are multidisciplinary.</p>	<p>Weekly feedback by fellow/senior resident/attending and monthly rotation evaluation by each MIS Surgery attending (<a href="https://stanford.medhub.com">https://stanford.medhub.com</a>)</p>

GOALS Core Competencies	R-1 OBJECTIVES	INSTRUCTIONAL ACTIVITIES	EVALUATION
<p><b>Systems-based Practice:</b> A resident must be able to demonstrate an awareness of and responsiveness to the system of health care and the ability to effectively call on system resources to provide optimal care.</p>	<ul style="list-style-type: none"> <li>• Be introduced to outpatient assessment, risk stratification and surgical planning for complex surgical oncology procedures.</li> <li>• Learn to use care protocols and pathways to improve quality of care.</li> <li>• Act as an organizational problem solver for patients.</li> <li>• Understands how efficient patient care enables the hospital to deliver a wide range of patient care.</li> <li>• Understands how care practice affects staffing and health care costs.</li> </ul>	<p>Twice daily rounds with the MIS Surgery Team and attending surgeon.</p> <p>Attendance in clinic with senior residents and attending surgeon.</p>	<p>Weekly feedback by fellow/ senior resident/attending and monthly rotation evaluation by each MIS Surgery attending  <a href="https://stanford.medhub.com">https://stanford.medhub.com</a></p>

**Medical Knowledge and Patient Care  
Goals and Objectives  
MINIMALLY INVASIVE/BARIATRIC SURGERY**

**Introduction**

At the conclusion of the rotation in Minimally Invasive Surgery, the resident should be able to provide comprehensive, state-of-the-art medical & surgical care to patients with surgical diseases approachable through minimal access techniques. This will include the abilities to investigate, diagnose, recommend appropriate treatment options, perform the operative procedures and provide the pre-, peri-, and post-operative care. To achieve this goal, this Curriculum provides a guide to the topics for study, and the knowledge and skills required in Minimally Invasive Surgery.

This modification of a National Curriculum consists of 8 Major Units, some with Subunits:

**Unit 1-** Advanced Laparoscopic Skills

**Unit 2-** Foregut

A. Esophagus

B. Stomach and Duodenum

**Unit 3** – Care of the Morbidly Obese

**Unit 4-** Midgut

**Unit 5-** Appendix

**Unit 6-** Spleen

**Unit 7-** Abdominal Wall and Retroperitoneum

**Unit 8-** Biliary System

Each Unit or Sub-unit is organized into 3 Sections:

1. **Objectives:** description of the topics the Resident must understand and the specific knowledge to be acquired.
2. **Content:** description of the specific areas of study necessary to achieve the unit objectives
3. **Clinical Skills:** description of the clinical activities and technical skills that are to be mastered

**Unit 1 – Advanced Laparoscopic Skills**

1. Objectives: Upon completion of this unit the resident will be able to understand and describe the following:
  1. Physiology of pneumoperitoneum.
  2. Proper selection and placement of trocars in a safe and effective manner.
  3. Proper positioning of patients for a given procedure with emphasis on safety and protection of patient and personnel.
  4. Proper placement of monitors and personnel to optimize operative approach.
  5. Proper choice of instrumentation, equipment, and energy sources.
  6. Trouble shoot MIS equipment including monitors, insufflation, and recording components.
  7. Safe use of Energy sources with advantages and limitations of each.
  
2. Content:
  1. Physiology of Pneumoperitoneum- describe the effect on the following:
    - a. Renal function
    - b. Cardiovascular function
    - c. Pulmonary function
    - d. Abdominal Wall and Diaphragm
  2. Laparoscopic Equipment
    - a. Monitor
    - b. Insufflator
    - c. Light Sources
    - d. Camera
    - e. Operating Table- standard, split leg
    - f. Trocar choices- bladed, bladeless, optical
  3. Energy Sources
    - a. Ultrasonic dissector
    - b. Monopolar cautery
    - c. Bipolar cautery
  
3. Clinical Skills:
  1. Demonstrate the following:

- a. Laparoscopic exposure of all intraabdominal areas, including use of retractors.
- b. Proper tissue handling and two handed surgical technique
- c. Intracorporeal and extracorporeal laparoscopic suturing
- d. Endoscopic stapling
- e. Intracorporeal anastomosis- linear and circular
- f. Laparoscopic adhesiolysis
- g. Laparoscopic running of bowel
- h. Placement and fixation of prosthetic materials

## **Unit 2 – Foregut**

### **A. Esophagus**

1. Objectives: Upon completion of this unit, the resident will have a comprehensive understanding of the embryology, anatomy, and physiology of the esophagus. The resident will have expertise in the investigation and treatment of esophageal disorders, with a focus on minimally invasive approaches.
2. Content:
  - a. Embryology, anatomy, and physiology of the thoracic and abdominal esophagus and the gastroesophageal junction
  - b. Physiologic and radiographic tests used in the evaluation and treatment of esophageal disorders
    - i. Esophageal manometry
    - ii. Barium/Gastrograffin swallow
    - iii. Computed tomography
    - iv. pH studies- Bravo probe, 24-hour with proximal and distal measurements
  - c. Endoscopic procedures
    - i. Esophagogastroduodenoscopy
      - Biopsy
      - Dilation
  - d. Achalasia

- i. Epidemiology
- ii. Natural History
- iii. Pathophysiology
- iv. Diagnosis
- v. Treatment
- e. Gastroesophageal reflux disease
  - i. Epidemiology
  - ii. Pathophysiology
  - iii. Complications
  - iv. Diagnosis
  - v. Treatment
- f. Hiatal Hernia
  - i. Epidemiology
  - ii. Pathophysiology
  - iii. Diagnosis
  - iv. Treatment

3. Clinical Skills:

- a. Identify and recognize the anatomic structures of the gastroesophageal junction both on imaging and intra-operatively
- b. Understand the salient features of the esophageal physiologic studies and interpret them.
  - i. Esophageal manometry
  - ii. Barium/Gastrograffin swallow
  - iii. Computed tomography
  - iv. pH studies- Bravo probe, 24-hour with proximal and distal measurements
  - v. Scintigraphy (esophageal)
  - vi. Impedence studies
- c. Describe the indication for and perform esophagogastroduodenoscopy, with biopsy.
- d. Describe the indications, options and potential complications of



minimally invasive procedures done for the following disorders of the esophagus:

- i. Achalasia
  - ii. Hiatal hernia
- e. Develop an operative strategy, including port positioning, patient positioning for the following minimally invasive esophageal procedures:
- i. Laparoscopic Heller myotomy
  - ii. Laparoscopic hiatal hernia repair
  - iii. Fundoplication
    - Nissen fundoplication
    - Toupet fundoplication
    - Dor fundoplication
    - Collis gastroplasty

## B. Stomach and Duodenum

1. Objectives: Upon completion of this unit, the resident will have a comprehensive understanding of the embryology, anatomy, and physiology of the stomach and duodenum. The resident will have expertise in the investigation and treatment of stomach and duodenal disorders, with a focus on minimally invasive approaches.

### 2. Content

- a. Embryology, physiology, and anatomy of the stomach and duodenum
- b. Physiologic and radiographic tests used in evaluation of stomach and duodenal disorders.
  - i. Computed tomography
  - ii. Magnetic resonance imaging
  - iii. Upper gastrointestinal series
  - iv. Gastric emptying study
- c. Endoscopic procedures
  - i. Esophagogastroduodenoscopy
  - ii. Endoscopic ultrasound

- d. Benign gastric disease
  - i. Peptic ulcer disease
    - Epidemiology
    - Natural History
    - Pathophysiology- including importance of Helicobacter pylori infection
    - Diagnosis- including malignant potential
    - Treatment- medical and surgical
    - Complications- stricture, gastric outlet obstruction
  - ii. Gastric Polyps
    - Classification
    - Epidemiology
    - Natural History
    - Pathophysiology
    - Diagnosis
    - Treatment- endoscopic, surgical, medical
- e. Bariatric procedures
  - i. Roux-Y Gastric Bypass- open or laparoscopic
  - ii. Laparoscopic adjustable gastric banding
  - iii. Vertical Sleeve Gastrectomy

### 3. Clinical Skills

- a. Identify and recognize the structures associated with the stomach and duodenum with particular attention to blood supply.
- b. Interpret the significance of the reports and images from the following physiologic and radiographic studies of the stomach and duodenum:
  - i. Computed tomography
  - ii. Magnetic resonance imaging
  - iii. Upper gastrointestinal series
  - iv. Gastric emptying study
- c. Interpret the results of and perform esophagogastroduodenoscopy
- d. Interpret the findings of endoscopic ultrasound

- e. Describe the indications, options and potential complications of minimally invasive procedures done for the following disorders of the stomach and duodenum:
  - i. Peptic ulcer disease
  - ii. Morbid Obesity
    - Roux-Y gastric bypass
    - Laparoscopic adjustable gastric banding
    - Sleeve gastrectomy
- f. Develop an operative strategy and perform the following procedures, including port positioning, patient positioning, and instrument selection.
  - i. Gastrojejunostomy
  - ii. Pyloroplasty
  - iii. Omental Patch for ulcer disease (Graham patch)
  - iv. Bariatric procedures

### **Unit 3 – Care of the Morbidly Obese**

#### **A. Understanding Morbid Obesity**

1. Objectives: Residents will obtain an in-depth understanding of obesity and its related diseases, including surgical and non-surgical treatment of these modalities.
2. Content: Minimum scope of understanding will include:
  - A. The epidemiology of obesity, including adolescent and geriatric obesity
  - B. The physiologic and interactive mechanisms of morbid obesity
  - C. The psychological issues associated with morbid obesity
  - D. Identification and management of nutritional deficiencies related to surgery
  - E. Outcomes of bariatric surgery
  - F. Residents should attend at least one bariatric surgery patient support group meeting during the rotation.
3. Clinical Skills:
  - A. Residents will apply such knowledge in evaluating obese patients for appropriate management.

- B. Residents will understand appropriate evaluation of the obese patient including end-organ by-products of the disease
  - a. Cardiac Disease
  - b. Pulmonary Disease
  - c. Musculoskeletal Disease
  - d. Psychological Disease
  - e. Metabolic Diseases
- C. Residents will provide patients with the information needed to choose appropriate management options.

B. Nonoperative Management of Obesity

1. Objectives: Residents will obtain and apply a comprehensive knowledge of management options for obesity without surgery.

2. Content:

- A. Caloric Management
- B. Exercise Physiology
- C. Pharmacologic Management

3. Clinical Skills:

- A. Residents will develop understanding of various diet and caloric management systems including how they work and short- and long-term outcomes. They will have an understanding of potential complications of low calorie diets and ability to monitor for adverse outcomes.
- B. Residents will understand the purpose of different exercise programs and the benefits/risks of each for the obese patient
- C. Residents will be well versed on medications (prescription and non-prescription) for weight control including appropriate dosing and usage. This will include an understanding of outcomes, side effects, and risks.

C. Primary Operative Management of Morbid Obesity

1. Objectives: Residents will develop surgical competence through experience with bariatric operations. Residents will develop the skills and knowledge to evaluate and care for patients preoperatively and postoperatively.

2. Content:

- A. Residents must be exposed to more than one type of weight loss operation:
  - a. Laparoscopic and open surgical access
  - b. Restrictive operations
    - i. Gastric band placement
    - ii. Sleeve gastrectomy
  - c. Gastric bypass
- B. While there is general consensus that skill improves with more experience, the minimum number of laparoscopic procedures to attain competence in bariatric procedures remains unclear.
- C. Residents must also know how to perform these weight loss procedures by the open approach.
- D. Preoperative evaluation and postoperative management of the bariatric patient, including obesity related conditions

3. Clinical Skills:

- A. Residents will participate in weight loss operations.
- B. The resident should perform key components of the operation.
- C. Residents will participate in preoperative evaluations:
  - a. Order and interpret appropriate testing
  - b. Consult with non-surgical specialists when needed
  - c. Evaluate most appropriate surgical options
  - d. Educate patient on benefits and risks of each option.
- D. Residents will participate in postoperative patient encounters (eg, hospital rounds) and postoperative outpatient evaluations

D. Revisional Operative Management of Morbid Obesity

- 1. Objectives: Residents will develop understanding of revision options, including the benefits and risks of each. Residents will develop surgical competence through experience with revisional bariatric procedures. Residents will develop the skills and knowledge to evaluate and care for patients preoperatively and postoperatively.
- 2. Content:
  - A. Residents will have experience with procedures for revision to treat complications or failure of previous bariatric surgery.

3. Clinical Skills:

- A. Residents will participate in preoperative evaluations for surgical revision:
  - i. Order and interpret appropriate testing
  - ii. Consult with non-surgical specialists when needed
  - iii. Evaluate most appropriate surgical options
  - iv. Educate patient on benefits and risks of each option.
- B. Residents will gain appropriate operative skill through primary and revisional procedures.

E. Management of Complications of Bariatric Surgery

1. Objectives: Residents will gain comprehensive understanding of management of complications and obesity related conditions.

2. Content:

- A. Early Complications
  - a. Identification
  - b. Management
- B. Late Complications
  - a. Identification
  - b. Management

3. Clinical Skills:

- A. Residents will demonstrate ability to detect post operative complications through history and clinical examination.
- B. Residents will demonstrate an understanding of the physiologic impact of delaying diagnosis or treatment of postoperative complications.
- C. Residents will demonstrate appropriate use and interpretation of diagnostic tests to determine presence and magnitude of post operative complications.
- D. Residents will demonstrate a safe and logical plan of action, and show expediency in implementing management of postoperative complications.
- E. Residents will demonstrate the operative skill to manage such complications.

**Unit 4- Small Intestine**

1. Objectives: Upon completion of this unit, the resident will have a comprehensive understanding of the embryology, anatomy, and physiology of the small intestine. The resident will have expertise in the investigation and treatment of small intestinal disorders, with a focus on minimally invasive approaches.

## 2. Content

- a. Embryology, physiology, and anatomy of the small intestine
- b. Physiologic and radiographic tests used in evaluation of small intestinal disorders.
  - i. Computed tomography
  - ii. Magnetic resonance imaging
  - iii. Upper gastrointestinal series
  - iv. Small bowel follow through
- c. Endoscopic procedures
  - i. Enteroscopy- including intraoperative
  - ii. Pill camera enteroscopy
- d. Benign gastric disease
  - i. Small bowel obstruction
    - Etiology
      - a. mass
      - b. hernia
      - c. adhesive disease
    - Pathophysiology
    - Diagnosis
    - Treatment
    - Complication
  - ii. Crohn's Disease
    - Epidemiology
    - Natural History
    - Pathophysiology
    - Diagnosis
    - Treatment- surgical, medical

- iii. Meckel's diverticulum
  - Epidemiology
  - Natural History
  - Pathophysiology
  - Diagnosis
  - Indications for resection
- iv. Intussusception
  - Epidemiology
  - Natural History
  - Pathophysiology
  - Diagnosis
  - Indications for operation
- e. Malignant small intestinal tumors
  - i. Carcinoid tumor
    - Epidemiology
    - Pathophysiology
    - Diagnosis
    - Treatment
    - Management- medical and surgical
  - ii. Adenocarcinoma
    - Epidemiology
    - Pathophysiology
    - Diagnosis
    - Treatment
    - Management- adjuvant therapies
  - iii. Lymphoma
    - Epidemiology
    - Pathophysiology
    - Diagnosis
    - Treatment
    - Management- indications for surgery, adjuvant therapies



### 3. Clinical Skills

- a. Identify and recognize the structures associated with the small intestine.
- b. Interpret the significance of the reports and images from the following physiologic and radiographic studies of the small intestine:
  - i. Computed tomography
  - ii. Magnetic resonance imaging
  - iii. Upper gastrointestinal series
  - iv. Small bowel through
- c. Interpret the results of enteroscopy and pill camera studies
- d. Describe the indications, options and potential complications of minimally invasive procedures done for the following disorders of the small intestine:
  - i. Small bowel obstruction
  - ii. Crohn's disease
  - iii. Meckel's diverticulum
  - iv. Intussusception
  - v. Malignant small intestinal disease
    - Polyps
    - Adenocarcinoma
    - Carcinoid
- e. Develop an operative strategy and perform the following procedures, including port positioning, patient positioning, and instrument selection.
  - i. Laparoscopic small bowel resection with anastomosis
  - ii. Laparoscopic creation of Roux-Y limb

### **Unit 5- Appendix**

1. Objectives: Upon completion of this unit, the resident will have a comprehensive understanding of the embryology, anatomy, and physiology of the appendix. The resident will have expertise in the investigation and treatment of appendiceal disorders, with a focus on minimally invasive approaches.

2. Content

- a. Embryology, physiology, and anatomy of the appendix
- b. Physiologic and radiographic tests used in evaluation of appendiceal disorders.
  - i. Computed tomography
- c. Endoscopic procedures
  - i. Colonoscopy
- d. Benign appendiceal disease
  - i. Appendicitis
    - Etiology
    - Pathophysiology
    - Diagnosis
    - Treatment
    - Complication
  - ii. Crohn's Disease
    - Epidemiology
    - Natural History
    - Pathophysiology
    - Diagnosis
    - Treatment- surgical, medical
- e. Malinant appendiceal tumors
  - i. Carcinoid tumor
    - Epidemiology
    - Pathophysiology
    - Diagnosis
    - Treatment
    - Management- medical and surgical
  - ii. Adenocarcinoma
    - Epidemiology
    - Pathophysiology
    - Diagnosis
    - Treatment

- Management- adjuvant therapies
- iii. Lymphoma
  - Epidemiology
  - Pathophysiology
  - Diagnosis
  - Treatment
  - Management- indications for surgery, adjuvant therapies

### 3. Clinical Skills

- a. Identify and recognize the structures associated with the appendix.
- b. Interpret the significance of the reports and images from the following physiologic and radiographic studies of the small intestine:
  - i. Computed tomography
- c. Describe the indications, options and potential complications of minimally invasive procedures done for the following disorders of the appendix:
  - i. Appendicitis
  - ii. Crohn's disease
  - iii. Malignant appendiceal disease
    - Polyps
    - Adenocarcinoma
    - Carcinoid
- d. Develop an operative strategy and perform the following procedures, including port positioning, patient positioning, and instrument selection.
  - i. Laparoscopic appendectomy
  - ii. Laparoscopic ileocolic resection

### **Unit 6- Spleen**

1. Objectives: Upon completion of this unit, the resident will have a comprehensive understanding of the embryology, anatomy, and physiology of the spleen. The resident will have expertise in the investigation and treatment of splenic disorders, with a focus on minimally invasive approaches.

## 2. Content

- a. Embryology, physiology, and anatomy of the spleen with particular attention to other retroperitoneal structures.
- b. Physiologic tests used in evaluation of splenic disorders.
  - i. Biochemical studies
  - ii. Hematologic studies
- c. Radiographic test used in evaluation of splenic disorders
  - i. Computed tomography
  - ii. Magnetic resonance imaging
- d. Benign splenic disease
  - i. Hematologic disorders- ITP, TTP, polycythemia vera
    - Epidemiology
    - Diagnosis
    - Treatment
    - Indications for splenic resection
  - ii. Splenic cysts
    - Epidemiology
    - Diagnosis
    - Treatment
    - Indications for splenic resection
- e. Malignant splenic disease
  - i. Lymphoma
    - Epidemiology
    - Pathophysiology
    - Diagnosis
    - Treatment
    - Management- adjuvant therapies

## 3. Clinical Skills

- a. Identify and recognize the structures associated with the spleen.

- b. Interpret the images and significance of reports from the following radiographic studies of the spleen:
  - i. Computed tomography
  - ii. Magnetic resonance imaging
- c. Describe the indications, limitations, options and potential complications of minimally invasive procedures done for the following disorders of the spleen:
  - i. Hematologic disorders of spleen
  - ii. Splenic cysts
  - iii. Lymphoma
- d. Develop an operative strategy and perform the following procedures, including port positioning, patient positioning, and instrument selection. Particular focus on preoperative preparation for surgery.
  - i. Laparoscopic splenectomy

### **Unit 7- The Abdominal Wall and Retroperitoneum**

1. Objectives: Upon completion of this unit, the resident will have a comprehensive understanding of the embryology, anatomy, and physiology of the abdominal wall and retroperitoneum. The resident will have expertise in the investigation and treatment of abdominal wall disorders, with a focus on minimally invasive approaches.

#### 2. Content

- a. Embryology and anatomy of the abdominal wall and retroperitoneum.
- b. Radiographic test used in evaluation of abdominal wall and retroperitoneal disorders
  - i. Computed tomography
  - ii. Magnetic resonance imaging
- c. Hernia
  - i. Inguinal
    - Epidemiology
    - Diagnosis
    - Treatment
  - ii. Ventral
    - Classification- incisional, flank, spigelian

- Epidemiology
- Diagnosis
- Treatment
- iii. Graft materials
  - Synthetic grafts- gore-tex, polypropylene, polyester
  - Biomaterials- cadaver, porcine

d. Spinal Exposure

3. Clinical Skills

- a. Identify and recognize the structures associated with the abdominal wall and retroperitoneum.
- b. Interpret the images and significance of reports from the following radiographic studies of the abdominal wall and retroperitoneum:
  - i. Computed tomography
  - ii. Magnetic resonance imaging
- c. Describe the characteristics and indications for use of the following abdominal wall grafts
  - i. Synthetic mesh- Gore-Tex, polypropylene, polyester
  - ii. Biomaterials- cadaver and porcine grafts
- d. Describe the indications, limitations, options and potential complications of minimally invasive procedures done for the following disorders:
  - i. Inguinal hernia
  - ii. Ventral hernia
  - iii. Spinal exposure
- e. Develop an operative strategy and perform the following procedures, including port positioning, patient positioning, and instrument selection. Particular focus on preoperative preparation for surgery.
  - i. Laparoscopic inguinal hernia repair
    - TEP (Totally extraperitoneal hernia repair)
    - TAPP (Transabdominal preperitoneal hernia repair)
  - ii. Laparoscopic ventral hernia repair
  - iii. Laparoscopic spinal exposure

**Unit 8- Biliary Tree**

1. Objectives: Upon completion of this unit, the Resident will have a comprehensive understanding of the embryology, anatomy, and physiology of the biliary tree. The resident will have expertise in the investigation and treatment of biliary disorders, with a focus on minimally invasive approaches.

## 2. Content

- a. Embryology, physiology, and anatomy of the biliary tree.
- b. Physiologic tests used in evaluation of biliary disorders.
  - i. Biochemical studies
  - ii. Tumor markers
- c. Radiographic test used in evaluation of biliary disorders
  - i. Computed tomography
  - ii. Magnetic resonance imaging/MRCP
  - iii. HIDA scan
  - iv. Percutaneous cholangiography
- d. Endoscopic procedures used in evaluation of the biliary tree
  - i. ERCP
- e. Biliary disease
  - i. Cholelithiasis
    - Epidemiology
    - Diagnosis
    - Treatment
    - Management- medical vs. indication for surgery
    - Complications- cholecystitis, choledocholithiasis, gallstone pancreatitis
  - ii. Gallbladder polyp
    - Epidemiology
    - Pathophysiology
    - Diagnosis
    - Treatment
    - Management
  - iii. Biliary stricture

- Epidemiology
- Pathophysiology- primary or secondary
- Diagnosis
- Treatment
- Management

### 3. Clinical Skills

- a. Identify and recognize the structures associated with the biliary tree.
- b. Interpret the significance of the reports from the following physiologic studies of the liver:
  - i. Biochemical studies
- c. Interpret the images and significance of reports from the following radiographic studies of the liver:
  - i. Computed tomography
  - ii. Magnetic resonance imaging
  - iii. HIDA scan
  - iv. Percutaneous cholangiography
- d. Interpret the reports of the following endoscopic evaluations of pancreatic disorders:
  - i. ERCP
- e. Describe the indications, options and potential complications of minimally invasive procedures done for the following disorders of the pancreas:
  - i. Cholelithiasis
    - Cholecystitis- calculus and calculus
  - ii. Gallbladder polyp
  - iii. Biliary stricture
- f. Develop an operative strategy and perform the following procedures, including port positioning, patient positioning, and instrument selection.
  - i. Laparoscopic cholecystectomy
  - ii. Laparoscopic cholangiogram
  - iii. Laparoscopic intraoperative ultrasound
  - iv. Laparoscopic common bile duct exploration