

Stanford University General Surgery Residency Program
Minimally Invasive Surgery (MIS) Goals and Objectives for Residents: R-4
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Description

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

Goals

The goal of the MIS Surgery rotation is to provide the R-4 resident with means to:

- Gain the knowledge and experience in the inpatient and outpatient evaluation and management of patients for bariatric and advanced minimally invasive surgery procedures.
- Refine procedural skills commonly required in the care of these patients such as advanced laparoscopic cases (ventral hernia, inguinal hernia, and related procedures) in addition to endoscopy. The R-4 will perform advanced cases such as bariatric procedures and other advanced laparoscopic cases (Heller, Nissen, splenectomy, and inguinal hernias).
- Experience and understand the day-to-day function of a complex surgical service.

Objectives

The MIS R-4 rotation has the following objectives:

- The senior resident has shared responsibility with the MIS fellow for the management of all inpatients on the service both ICU and ward in conjunction with the attending.
- The R-4 resident functions as a main decision maker, assuming direct responsibility for the day-to-day care of patients on the service and coordinating care with other services. Certainly the fellow and attending surgeon is readily available for questions and to help as necessary with decision-making. The senior resident also serves as the first consultant for the intern regarding issues related to floor and ICU patients. He or she will develop leadership skills in the management and guidance of inpatient surgical teams and supervision and education of all residents and students.
- The R-4 resident gains knowledge of and encompassing bariatric surgery and advanced minimally invasive surgery through discussion on rounds with the attending physician and also by independent reading. This knowledge base includes basic or complex, open and laparoscopic procedures as listed above.
- The R-4 resident gains these advanced operative skills through pre-operative reading and preparation and by direct intra-operative teaching from the MIS attending.

R-4 residents can expect frequent teaching from members of the team, fellow, and attendings. The R-4 resident and the attending will function together very closely in the OR, at the bedside and during formal and informal daily rounding sessions. The R-4 resident is a leader on the team, and should be able to run the entire service with the intern, nurses, and medical students. At the end of the rotation the R-4 resident should be able to diagnose, preoperative assess, perform the operative procedure, and manage the patient postoperatively, identifying and managing complications that may arise.

R-4 residents 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 R-4 Residents

GOALS Core Competencies	R-4 OBJECTIVES	INSTRUCTIONAL ACTIVITIES	EVALUATION
<p>Knowledge: 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 and the other areas already listed.</p>	<ul style="list-style-type: none"> Residents will be expected to demonstrate understanding of the anatomy, physiology and pathologic conditions of the entire GI tract, abdominal cavity, abdominal wall, and solid organs in the abdominal cavity and retroperitoneum. Residents will demonstrate an understanding of the surgical and nonsurgical options for managing pathologic conditions of the entire GI tract, abdominal cavity, abdominal wall, and solid organs in the abdominal cavity and retroperitoneum. Residents are expected to be able to appropriately order, read, and interpret diagnostic tests and images. PGY-4 residents are expected to achieve basic FLS certification. The specific medical knowledge expectations appear in the curricula of the specific subspecialty categories specified subsequently. 	<ul style="list-style-type: none"> Teaching by attending faculty Independent reading Daily rounds and conferences including Morbidity and Mortality, Grand Rounds and Core Course, GI Conference, and GI Clinical Conference. 	<p>Weekly feedback by fellows/chief resident/attending and Rotation evaluation by each MIS attending. (https://stanford.medhub.com)</p>

GOALS Core Competencies	R-4 OBJECTIVES	INSTRUCTIONAL ACTIVITIES	EVALUATION
<p>Patient Care: To provide compassionate, appropriate and effective care patients in the listed categories.</p>	<ul style="list-style-type: none"> Residents will be expected to perform preoperative assessment of patients and demonstrate an understanding of the management options, indications, contraindications, and complications associated with the recommended procedure. Residents should demonstrate understanding of and ability to order, integrate and interpret perioperative testing and evaluation of all organ systems as related to advanced GI surgery. Residents will demonstrate intraoperative decision-making that minimizes complications and demonstrates an awareness of the limitations of his/her technical skills. Residents will demonstrate knowledge of anatomy of the GI tract and the abdominal cavity, including as viewed through MIS access, both normal and abnormal. Residents will demonstrate knowledge of a variety of 	<p>Runs twice daily rounds with the MIS team and attendings once daily.</p> <p>Preoperative and post-operative monitoring of other residents and student work and notes.</p> <p>Teaching during rounds and conferences.</p> <p>Providing feedback to the others on the MIS Team.</p>	<p>Weekly feedback by other residents and nurses as well as the MIS attendings and two month rotation evaluation by each MIS attending. (https://stanford.medhub.com)</p>

	<p>approaches (both operative and nonoperative) to a given GI tract disease and exhibit reasoning to arrive at the correct procedure for a given patient.</p> <ul style="list-style-type: none"> • Residents will demonstrate expertise in interpreting anatomic and physiologic studies of the GI tract and abdominal cavity relevant to their areas of expertise. • Residents will demonstrate fundamental MIS competency relevant to their area of expertise. These would include some or all of the following: • Basic Skills: <ul style="list-style-type: none"> ○ preoperative preparation (positioning, knowledge of necessary equipment, bowel prep); evaluations of cardiopulmonary system, age, body habitus ○ exposure ○ retraction ○ tissue handling ○ camera navigation ○ two-handed manipulation ○ port-site placement ○ alternative access techniques ○ use of angled scopes ○ Fundamentals of Laparoscopic Surgery (FLS) completion (PGY-4) ○ vascular control and algorithm for control of bleeding ○ knot-tying ability, both hands, intracorporeal and extracorporeal ○ decision to convert a laparoscopic procedure to an open operation • Advanced Skills: <ul style="list-style-type: none"> ○ suturing ○ stapling ○ intracorporeal anastomosis ○ adhesiolysis ○ running of bowel ○ demonstrates knowledge of energy sources ○ placement and fixation of prosthetic material • Endoscopy <ul style="list-style-type: none"> ○ upper endoscopy ○ balloon dilation ○ cold biopsy 		
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<p>Effective Interpersonal and Communication skills: Residents must communicate in a way that leads to effective information exchange of a vascular surgery care plan to patients, their families, and professional associates.</p>	<ul style="list-style-type: none"> • Instruct interns and medical students on basic general surgical techniques in the surgical simulation center. • Deliver teaching sessions for interns and students either before or after rounds on a weekly basis. • Provide family members an update of patient's condition. • Discusses appropriate peri-operative concerns with team & consultants. • Works effectively with team members (attending, interns and NP) to communicate care plan and discuss with attendings. 	<p>Twice daily rounds with the MIS Team.</p>	<p>Weekly feedback by Senior Resident/Attending and Rotation evaluation by each MIS attending. (https://stanford.medhub.com)</p>
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GOALS Core Competencies	R-4 OBJECTIVES	INSTRUCTIONAL ACTIVITIES	EVALUATION
<p>Practice based learning and improvement: In order to improve patient care practices, R-4 residents must be able to critically evaluate their own performance as well as appraise and incorporate clinical scientific evidence.</p> <p>Professionalism: Residents must show a commitment to professional responsibilities, adherence to ethical principles and sensitivity to diversity.</p>	<ul style="list-style-type: none"> • Serve as team leader as the PGY-4. Works effectively with team inpatient census, reporting requirements, team schedules, vacation coverage, daily clinical assignment, patient management tasks and morbidity and mortality conference. • Master and teach all general surgery scenarios on the Goodman Simulator. • Identify complications and determine their impact on recovery. Present them at the M&M conference. • Use information technology to rapidly assimilate current medical literature as it relates to patient care. • Learn to manage complex patient problems specifically related to relaying information to families regarding unexpected outcomes in a quaternary care hospital. • Learn to interact with a wide range of patient age ranges. • Learn to interact with multiple subspecialty groups in consultation as well as multi-disciplinary conferences. • Displays appropriate demeanor, even in adverse situations. 	<p>Twice daily rounds with the MIS Team and attending surgeon.</p> <p>Daily Conferences.</p> <p>Twice daily rounds with the MIS Team.</p>	<p>Weekly feedback by other residents and nurses as well as the MIS attendings and two month rotation evaluation by each MIS attending. (https://stanford.medhub.com)</p> <p>Weekly feedback by other residents and nurses as well as the MIS attendings and two month rotation evaluation by each MIS attending. (https://stanford.medhub.com)</p>
	<ul style="list-style-type: none"> • Acts with sensitivity and responsiveness to patient's culture, age, gender and disabilities. • Residents will display compassion and respect for the morbidly obese. • Residents will treat all members of the health care team with respect regardless of their level of power or influence. • Residents will advocate for patients' needs and desires even if 		

	<p>they differ from the resident's views.</p> <ul style="list-style-type: none"> Residents will take personal responsibility for the timely completion of all assigned work and medical records. Residents will demonstrate the importance of teamwork by assisting colleagues in need. Residents will demonstrate honesty in their interactions with patients and team members by practicing full disclosure of information with their patients, admitting and disclosing patient care errors, and admitting weaknesses as well as knowledge gaps. Residents will demonstrate respect of patient confidentiality and the importance of best practices for insuring optimal care in the clinical setting. 		
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GOALS Core Competencies	R-4 OBJECTIVES	INSTRUCTIONAL ACTIVITIES	EVALUATION
<p>Systems-based Practice: An R-4 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"> Residents will demonstrate understanding of new technologies and their role in the care of their patients. Residents will demonstrate understanding of the integrative nature of health care and will coordinate the care of their patients utilizing the support of consulting physicians, allied health professionals, and ancillary staff. Residents will develop appropriate discharge and disposition plans for patients by assessing the patients' access to out-patient services, resources for paying for medications and tests, and by working cooperatively with the discharge planning service to obtain needed treatments and follow-up for their patients. Residents will communicate the discharge plan with the patient's referring physician to insure adequate follow-up care. Residents will practice cost-effective medicine. Specifically, they will learn to avoid unnecessary tests and minimize length of stay while providing high quality care. Residents will demonstrate understanding of the importance of institutional policy in promoting patient health through strict adherence to infection control policies and specific treatment protocols. Residents will demonstrate understanding of documentation criteria for different levels of care. 	<p>Twice daily rounds with the MIS Team and daily rounds with surgery attendings.</p>	<p>Weekly feedback by other residents and nurses as well as the MIS attendings and two month rotation evaluation by each MIS Surgery attending. https://stanford.medhub.com</p>

	<ul style="list-style-type: none"> Residents will develop an understanding of the nature and importance of regulatory requirements implemented by agencies such as the Joint Commission, CMS, and RRC. 		
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**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. Malignant 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

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

- Embryology and anatomy of the abdominal wall and retroperitoneum.
- Radiographic test used in evaluation of abdominal wall and retroperitoneal disorders
 - Computed tomography
 - Magnetic resonance imaging
- Hernia
 - Inguinal
 - Epidemiology
 - Diagnosis
 - Treatment
 - 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