

THE FELLOWSHIP COUNCIL
ADVANCED GI SURGERY CURRICULUM FOR
FLEXIBLE ENDOSCOPY

1. Introduction

While general and thoracic surgical training now require basic skills in flexible GI endoscopy, advanced training is usually required to achieve expertise in not only the technical aspects of performing therapeutic GI endoscopy, but also an understanding of how endoscopy is used for the global care of patients with GI and hepatobiliary disorders.

- The purpose of a fellowship in surgical endoscopy is to provide a structured educational and training experience necessary to achieve expertise in flexible endoscopy of the GI tract
- This curriculum provides:
 - Flexible endoscopy Program Directors with a framework for instruction and evaluation of fellows
 - Fellows with a guide to the study of flexible endoscopy that defines the essential areas of knowledge and technical skills that need to be mastered.

2. Curriculum Structure

This curriculum for the Flexible Endoscopy Fellowship should be considered within the broader context of the core curriculum for the Advanced GI Surgery Fellowship. This document, as produced and maintained by The Fellowship Council details the core requirements common to all fellowships in Advanced GI Surgery, including those denoted as providing advanced training in:

- Minimally Invasive Surgery (MIS) (SAGES)
- Bariatric Surgery (ASMBS)
- Hepato-pancreatic & biliary surgery (AHPBA)
- Flexible endoscopy (SAGES)
- GI Surgery (SSAT)

It is intended that each of the respective national societies will be responsible for establishing and maintaining a curriculum that describes the specific goals, and detailed objectives that are relevant to their sub-specialty fellowship, and that these curricula be included in the curriculum for the Advanced GI Surgery Fellowship.

The curriculum for the Advanced GI Surgery Fellowship describes the following goals and objectives in the framework of the ACGME core competencies (which are common to, and required by, all fellowships in Advanced GI Surgery) including:

1. Patient care, including minimum laparoscopic surgical skills
2. Medical knowledge
3. Practice-based learning and improvement
4. Interpersonal and communication skills
5. Professionalism

6. Systems-based practice

These are also fundamental requirements of the curriculum for the Flexible Endoscopy fellowship. The present document will describe the distinct medical knowledge and technical skills required by fellows to become an expert of Flexible Endoscopy.

This curriculum for a Flexible Endoscopy fellowship has been approved by the Executive Committee of SAGES on _____.

3. **Overview of the curriculum for the Flexible Endoscopy Fellowship.**

At the conclusion of the fellowship in Flexible Endoscopy, the fellow will be able to provide comprehensive, state-of-the-art medical and surgical care to patients with conditions requiring flexible endoscopy. This will include the ability to investigate, diagnose, recommend appropriate treatment options, perform flexible endoscopy procedures, and provide the pre- peri- and late postoperative care. To achieve this goal, this curriculum provides a guide to the topics for study, and the knowledge and skills required to become an expert using Flexible Endoscopy as a surgeon.

This curriculum consists of 6 major units, some with subunits:

Unit 1 – Acid-peptic disease

Unit 2 – Biliary tract diseases and pancreatic disorders

Unit 3 – Gastrointestinal malignancy

Unit 4 – Motility

Unit 5 – GI Pathology

Unit 6 – Endoscopy

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

1. **Objectives:** description of the topics the Fellow 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 – Acid-peptic disease

1. Objectives: Upon completion of this unit the fellow will understand:
 - a. The anatomy, physiology and pathophysiology of the esophagus, stomach and duodenum
 - b. The natural history, epidemiology, and complications of acid-peptic disorders, including recognition of pre-malignant conditions (e.g. Barrett metaplasia)
 - c. The role of H. pylori in acid-peptic conditions
 - (1) Epidemiology
 - (2) Pathophysiology
 - (3) Diagnosis

- (4) Treatment
 - d. The role of NSAIDs in the pathogenesis of gastroduodenal ulcers and their complications
 - e. Appropriate pharmacology for the treatment of acid-peptic disorders
 - f. Endoscopic and surgical treatments of acid-peptic disorders
2. Content:
- a. Basic embryology of the foregut
 - b. Anatomy of the esophagus, stomach and duodenum
 - (1) Normal
 - (2) Endoscopic landmarks
 - (3) Variations
 - (4) Vulnerable areas to disease
 - (a) Ulcer
 - (b) Metaplasia
 - (c) Structural defect (e.g. hiatal hernia)
 - c. Natural history of acid-peptic disorders
 - (1) GERD
 - (2) Ulcer
 - (3) Risk for malignancy
 - d. H. pylori
 - (1) Epidemiology
 - (2) Pathophysiology
 - (1) Virulence factors
 - (2) Natural distribution
 - (3) Diagnosis
 - (1) Breath test
 - (2) Serum test
 - (3) Colorimetric testing
 - (4) Pathology
 - (4) Treatment
 - (a) Accepted regimens
 - (b) Resistant strains
 - (5) Risk for development of malignancy

- e. NSAID
 - (1) Pathogenesis of ulcers
 - (2) Risk factors for development of NSAID-induced ulcers
 - (3) Relative risk of different preparations
 - (a) Arachidonic acid
 - (b) COX-2
 - (4) Prophylaxis against ulcer development
 - f. Pharmacology
 - (1) Available formulations
 - (2) Efficacy
 - (3) Mechanism of action
 - (4) Appropriate dosing
 - (5) Measuring effectiveness
 - g. Physiologic testing
 - (1) Esophageal pH testing
 - (2) Esophageal impedance
 - (3) Gastric secretion
 - (4) Serum testing (e.g. gastrin)
 - h. Endoscopic management
 - (1) Indications and contraindications
 - (2) Endoscopic tools
 - (a) Visualization
 - (b) Sampling
 - (c) Treatment
 - i. nonthermal
 - ii. thermal
 - a. contact
 - b. noncontact
 - iii. mechanical
 - a. clips
 - b. suture
 - i. Non-endoscopic management
 - (a) Pill cam
 - (b) Angiography
3. Clinical Skills:
- a. Assess a patient for acid-peptic disease
 - b. Recommend appropriate empiric therapy for presumed acid-peptic disease
 - c. Generate a treatment plan for acid-peptic disease
 - (1) Diagnostic testing including interpretation of pH testing and gastric secretory studies as well as H. pylori testing
 - (2) Therapeutic interventions
 - (3) Monitoring of therapy
 - d. Assess, triage, and stabilize a patient bleeding from acid-peptic disorder
- e. Endoscopy
- (1) Diagnostic upper endoscopy
 - (a) Biopsy

- (b) Placement of radiotelemetry
- (c) Navigate altered anatomy
- (d) Photo documentation
- (e) Procedure documentation
- (2) Therapeutic upper endoscopy
 - (a) Passage of a double lumen and side viewing endoscope
 - (b) Passage of an enteroscope
 - (c) Successful treatment of bleeding ulcer using multiple modalities
 - i. Nonvariceal
 - ii. Variceal
 - (d) Dilation
 - i. balloon
 - ii. Bougie
- (3) 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. For current recommendations, please see the Appendix.

Unit 2 - Biliary tract diseases and pancreatic disorders

1. Objectives: Upon completion of this unit the fellow will have a comprehensive understanding of:
 - a. The intra and extra hepatic anatomy and pancreas as well as its embryology and physiology.
 - b. The fellow will also have expertise in the investigation of diseases of the liver and pancreas and endoscopic modalities of treatment.
2. Content:
 - a. Biliary
 - (1) Basic embryology and anatomy of the biliary tree and congenital structural anomalies
 - (2) Hormonal and neural regulation of bile flow and gallbladder function
 - (3) Physiology of bile secretion and its derangement in cholestatic disorders
 - (4) Cholelithiasis
 - (a) Epidemiology
 - (b) Etiology
 - (c) Clinical manifestations
 - (d) Complications
 - (e) Treatment
 - (5) Acalculous cholecystitis
 - (6) Neoplastic disorders of the gallbladder and bile ducts
 - (7) Motility disorders of the biliary system
 - (a) Sphincter of Oddi dysfunction
 - (b) Biliary dyskinesia
 - (8) Radiographic evaluation of the biliary tree
 - (a) Ultrasound
 - (b) CT
 - (c) MRI/MRCP
 - (d) Scintigraphic techniques

- (e) PTCA
- (9) Principles, utility, and complications of biliary surgery
- b. Pancreas
 - (1) The embryological development and anatomy of the pancreas and the pancreatic duct system and congenital disorders such as pancreas divisum and annular pancreas
 - (2) The physiology of pancreatic exocrine secretion
 - (3) Acute pancreatitis
 - (a) Epidemiology
 - (b) Etiology
 - (c) Pathophysiology
 - (d) Natural history
 - (e) Management
 - (4) Chronic pancreatitis
 - (a) Epidemiology
 - (b) Etiology
 - (c) Pathophysiology
 - (d) Natural history
 - (e) Management
 - (5) Pancreatic cancer
 - (a) Epidemiology
 - (b) Natural History
 - (c) Management
 - (6) Radiologic evaluation of the pancreas
 - (a) Ultrasound
 - (b) EUS
 - (c) CT
 - (d) MRI/MRCP
 - (7) Principles, utility, and complications of pancreatic surgery
 - (8) Indications for and interpretation of diagnostic tests of the pancreas
 - (a) Serum amylase and lipase
 - (b) Tumor markers
 - (c) Tests of pancreatic secretory function
 - (d) Cytologic examination of pancreatic masses
 - (e) Aspiration of cystic pancreatic lesions

3. Clinical Skills:

- a. Accurately interpret images of the pancreas and liver
 - (1) Correctly identify normal anatomic structures
 - (2) Recognize pathology
 - (3) Identify anatomic anomalies and the embryologic origin if applicable
- b. Demonstrate a thorough knowledge of the endoscopic techniques used to diagnose and treat diseases of the biliary and pancreatic tracts
 - (1) Indications and contraindications for use
 - (2) Complications
 - (3) Limitations
 - (4) Relative cost
- c. Demonstrate an understanding of alternative diagnostic and therapeutic modalities in the management of biliary and pancreatic disorders
 - (1) Radiologic

- (2) Interventional radiology
- (3) Surgery
- (4) Medical
- d. Have at least a basic understanding of endoscopic retrograde cholangiopancreatography
 - (1) Able to pass a side-viewing duodenoscope safely to gain visualization of the ampulla
 - (2) Understand correct positioning of the patient for the procedure
 - (3) Understand the risks of the procedure and how to manage them
 - (4) Understand the limits of the procedure
 - (5) Correctly interpret cholangiograms and pancreatograms
- e. If the fellow plans to practice ERCP a higher level of expertise is required
 - (1) Basic understanding described in "4" above
 - (2) At least 12 months of training
 - (3) Participation in cases
 - (a) Minimum of 80% cannulation success rate
 - (b) At least 60% of cases therapeutic
 - (4) Sphincterotomy
 - (5) Stone extraction
 - (6) Stenting
 - (7) While there is general consensus that skill improves with more experience, the minimum number of procedures to attain competence in procedures related to ERCP remains unclear. For current recommendations, please see the Appendix.
 - (8) Thorough understanding of radiation safety, use of fluoroscopy, interpretation of radiologic images of the biliary and pancreatic ductal anatomy
- f. A basic understanding of endoscopic ultrasound
 - (1) Indications and limitations of the technique
 - (2) Methods of tissue acquisition
 - (3) Potential complications

Unit 3 - Gastrointestinal Malignancy

1. Objectives: Upon completion of this unit the Fellow will have a comprehensive understanding of the use of flexible endoscopy for the diagnosis and treatment of malignant neoplasms of the GI tract.
2. Content:
 - a. Have a thorough familiarity with the literature on the epidemiology, primary prevention of, and screening recommendations for:
 - (1) Colon cancer
 - (2) Barrett esophagus
 - (3) FAP
 - (4) HNPCC
 - b. Have a working understanding of the approaches to the genetic diagnosis of:
 - (1) HNPCC
 - (2) FAP
 - c. Be familiar with the technical considerations in the therapy of colorectal adenomas and carcinomas
 - d. Be thoroughly experienced in the techniques of colonoscopy, polypectomy, and ablative therapy
 - e. Understand the appropriate surveillance for patients at high risk for developing cancer
 - f. Understand endoscopic palliation options for nonoperative cancer conditions
3. Clinical Skills: The fellow will demonstrate an expertise in:
 - a. The endoscopic management of Barrett's esophagus
 - (1) Identification
 - (a) HD endoscopy
 - (b) NBI endoscopy
 - (c) Chromoendoscopy
 - (2) Tissue sampling
 - (3) Ablative therapies (at least a familiarity)
 - (a) RF ablation
 - (b) PDT
 - (c) Thermal
 - (d) Cryogenic
 - b. Endoscopic management of UGI neoplasias associated with FAP
 - (1) Gastric lesions
 - (2) Duodenal lesions
 - (3) Perampullary lesions
 - c. Proper and safe technique for performing colonoscopy
 - d. Proper technique for polypectomy of sessile and pedunculated polyps including saline injection
 - e. Familiarity with advanced resection techniques for lesions in the GI tract
 - (1) Piecemeal excision
 - (2) EMR
 - (3) ESD
 - (4) Ablation
 - (a) APC
 - (b) RF

- f. Familiarity with emerging endoscopic imaging techniques
 - (1) Confocal laser endoscopy
 - (2) Optical coherence endoscopy
 - (3) Chromoendoscopy
 - (4) Magnification endoscopy
- g. Expertise in endoscopic screening for colon malignancy
 - (1) Average risk
 - (2) Moderate risk
 - (3) High risk

Unit 4 - Motility

1. Objectives: Upon completion of this unit the fellow will have a comprehensive understanding of the pathophysiology of conditions caused by dysmotility of the GI tract and understand the diagnostic and therapeutic techniques appropriate for those conditions.
2. Content: the fellow will demonstrate an understanding of:
 - a. Normal esophageal motility
 - b. Abnormal esophageal motility
 - (1) Achalasia
 - (2) Diffuse esophageal spasm
 - (3) Ineffective esophageal motility
 - (4) Scleroderma
 - c. The features of esophageal pH and impedance testing and the limitations of these studies
 - d. The features of scintigraphic evaluation of gastric emptying and the limitation of this study
 - e. The features of sphincter of Oddi manometry, its risks, and the limitation of this study
 - f. Understand how all these manometric, pH, and manometry tests are performed and when they may be contraindicated
3. Clinical Skills:
 - a. Properly interpret an esophageal pH study
 - b. Be familiar with how to interpret an esophageal impedance study
 - c. Understand how to place radiotelemetry for esophageal pH testing
 - d. Recognize normal and common abnormal esophageal motility patterns
 - (1) Achalasia
 - (2) Diffuse esophageal spasm
 - (3) Ineffective esophageal motility
 - (4) Scleroderma
 - e. Understand the classifications of sphincter of Oddi dysfunction and their treatment

Unit 5 - GI Pathology

1. Objectives: Upon completion of this unit the fellow will have an understanding of the requirements for adequate histopathologic diagnosis.

2. Content:
 - a. Demonstrate ability to recognize patterns of histopathologic change in gastrointestinal disorders
 - b. Understand what constitutes an adequate biopsy sample and how to handle the sample for the proposed test
 - c. Understand when it is appropriate to biopsy, the limitations of biopsy, and how the biopsy will aid the diagnosis
 - d. Demonstrate the ability to provide information to the pathologist to aid in the diagnosis
 - (1) Appropriate background and clinical information
 - (2) Appropriate macroscopic description of the tissue and the specific location of the biopsy
 - e. Understand the utility and limitations of brush biopsy and fine needle aspiration in the work-up of GI and pancreaticobiliary diseases
 - f. Be familiar with new mechanisms for pathologic diagnosis
 - (1) Flow cytometry
 - (2) Immunohistochemistry
 - (3) Molecular biology

3. Clinical Skills:
 - a. Understand the appropriate methods and requirements to obtain adequate biopsy specimens using flexible endoscopy techniques.
 - b. Competently perform biopsies of the GI tract using flexible endoscopy.

Unit 6 - Endoscopy

1. Objectives: While the techniques in this unit are interwoven in the others, it is described separately to emphasize that training in endoscopy does not simply mean manipulating an endoscope. This section also includes techniques that have not been included elsewhere.

2. Content: Upon completion of this unit the fellow will:
 - a. Properly prepare a patient do undergo an endoscopic procedure
 - b. Administer conscious sedation to maintain patient comfort and safety throughout an endoscopic procedure
 - c. Perform diagnostic and therapeutic upper endoscopy
 - d. Perform diagnostic and therapeutic lower endoscopy
 - e. Gain enteral access using endoscopic guidance
 - f. Perform intraoperative endoscopy to assess post-surgical states
 - g. Have at least a familiarity with the techniques of ERCP and EUS

3. Clinical Skills:
 - a. General skills for all procedures
 - (1) Understand the indications and contraindications for the use of endoscopy in the care of patients with gastrointestinal disorders
 - (2) Properly obtain informed consent for an endoscopic procedure
 - (3) Properly prepare a patient for an endoscopic procedure

- (a) Risk assessment for conscious sedation
- (b) NPO status
- (c) Management of anticoagulation medications
- (d) Prophylactic antibiotics
- (e) Bowel preparation
- (4) Safely direct the administration of moderate conscious sedation
- (5) Conduct thorough examination of the entire organ and correctly identify landmarks
- (6) Completes examination in a reasonable time and prepares an accurate report
- (7) Recognizes and manages complications expeditiously
- (8) Plan correct management and disposition and discuss findings with the patient and referring physician
- (9) Conduct proper follow-up, review of pathology, and case outcome
- b. Diagnostic esophagogastroduodenoscopy
 - (1) Esophageal intubation
 - (2) Pyloric intubation
 - (3) Biopsy
 - (4) Placement of radiotelemetry
 - (5) Navigate altered anatomy
 - (6) Photo documentation
 - (7) Procedure documentation
- c. Therapeutic EGD
 - (1) Passage of a double lumen and side viewing endoscope
 - (2) Successful treatment of bleeding ulcer using multiple modalities
 - (a) Nonvariceal
 - i. Thermal
 - a. injection
 - b. Multipolar
 - b. Heater probe
 - d. APC
 - ii. Nonthermal
 - a. Clips
 - b. Familiarity with:
 - Fibrin glue
 - Endoscopic suturing
 - iii. Variceal
 - a. Banding
 - b. Familiarity with sclerotherapy
 - (3) Dilation
 - (a) Balloon
 - (b) Bougie
 - (4) Placement of feeding tube
 - (a) Nasojejunal
 - (b) PEG
 - (c) PEG/PEJ
 - (d) Direct PEJ
 - (5) Placement of radiotelemetry pH probe
 - (6) Placement of enteral stent
- d. Push enteroscopy
- e. Colonoscopy

- (1) Able to completely evaluate the lower GI tract
 - (a) Cecal intubation
 - (b) Intubation of the terminal ileum
 - (c) Retroflexion to view the anal canal
- (2) Therapy
 - (a) Polypectomy
 - i. snare
 - ii. hot biopsy
 - iii. saline life
 - iv. piecemeal
 - v. specimen retrieval
 - (b) Bleeding
 - i. injection
 - ii. thermal
 - iii. mechanical
 - (c) Placement of stent
- f. ERCP (if fellow desires to perform in practice after fellowship)
 - (1) Safe passage of side-viewing duodenoscope
 - (2) Selective cannulation of the desired duct
 - (3) Opacification of the desired duct
 - (4) Correct interpretation of the cholangiogram or pancreaticogram
 - (5) Sphincterotomy
 - (6) Stone extraction
 - (7) Placement of stent
- g. EUS (if fellow desires to perform in practice after fellowship)
 - (1) Intubation of the esophagus
 - (2) Intubation of the pylorus
 - (3) Imaging of desired organ or lesion
 - (4) Successful fine needle aspiration of lesion
 - (5) Tumor staging in agreement with the surgical findings and similar to that reported in the literature
- h. While there is general consensus that skill improves with more experience, the minimum number endoscopic procedures to attain competence in the various flexible endoscopic procedures remains unclear. For current recommendations, please see the Appendix.

Appendix

While there is general consensus that skill improves with more experience, the minimum number of procedures to attain competence in flexible endoscopy procedures remains unclear. Currently the American Society for Gastrointestinal Endoscopy recommends the following case numbers:

Unit 1 – Acid-peptic disease:

<u>Clinical Skills</u>	<u># Procedures</u>
Endoscopy (ASGE)	130
Therapeutic upper endoscopy – nonvariceal (ASGE)	10 actively bleeding
Therapeutic upper endoscopy –variceal (ASGE)	20 (5 actively bleeding)
Dililation (ASGE)	20

Unit 2 – Biliary tract diseases and pancreatic disorders for fellow planning on practicing ERCP

<u>Clinical Skills</u>	<u># Procedures</u>
ERCP	200 with: - 80% cannulation success rate - 60% of cases therapeutic

Unit 6 – Endoscopy

<u>Clinical Skills</u>	<u># Procedures</u>
EGD	130 - 25 nonvariceal hemorrhage (10 active) - 20 variceal hemorrhage (5 active) 20 Dililation (balloon & bougie) 15 PEG
Colonoscopy	140 - 30 w/polypectomy & hemostatis
ERCP	200 - 80% selective cannulation success rate (minimum)
EUS	150 50 EUS guided FNA

- 25 nonpancreatic
- 25 pancreatic
75 pancreaticobiliary

