



**THE AMERICAN BOARD OF SURGERY**

**FLEXIBLE ENDOSCOPY CURRICULUM  
FOR  
GENERAL SURGERY RESIDENTS**

*Table of Contents*

*(click to go to section)*

<b>ABS Flexible Endoscopy Curriculum.....</b>	<b>2</b>
LEVEL 1 (PGY-1 or -2) .....	4
LEVEL II (PGY-1 or -2).....	5
LEVEL III (PGY-2 or -3) .....	6
LEVEL IV (PGY-3 or -4) .....	8
LEVEL V (PGY-4 or -5) .....	9
<b>Appendices - Resources</b>	
APPENDIX A – Suggested Cognitive and Technical Resources by Level.....	10
APPENDIX B – Additional Recommended Readings .....	22
APPENDIX C – GAGES Scoresheets.....	26

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## ABS Flexible Endoscopy Curriculum

**Overview:** The Flexible Endoscopy Curriculum (FEC) is designed to provide general surgery training programs with a stepwise, milestone-based curriculum that includes both didactic and hands-on training. Upon the successful completion of this curriculum, a general surgery resident will possess the knowledge and skill to be a surgical endoscopist with the ability to provide endoscopic services to patients in any clinical setting.

**Purpose:** Upon completion of this curriculum, a general surgery resident will have the knowledge and technical skill to manage commonly encountered gastrointestinal (GI) diseases and conditions using flexible endoscopy.

**Definition:** A *surgical endoscopist* is a surgeon who has the knowledge and technical skill to use flexible endoscopy to provide care for patients with common gastrointestinal diseases. This ability includes:

1. An understanding of the indications and contraindications for performing upper and lower endoscopy
2. Accurate recognition and management of normal and abnormal findings in the GI tract
3. Recognition and management of complications from performing GI endoscopy
4. Safe performance of upper and lower endoscopy including complete navigation of the esophagus, stomach, proximal duodenum, and colon
5. Mucosal inspection and recognition of lesions that may require surgery
6. Tissue acquisition using biopsy or polypectomy
7. Management of periprocedural bleeding
8. Placement of a percutaneous endoscopic gastrostomy (PEG)

**Structure:** This curriculum is intended to be completed during general surgery residency training. It is designed with the recognition that flexible endoscopy is only one component of an entire surgical residency, and therefore care has been taken to not overwhelm the resident or program director, but rather, to provide a stepwise curriculum with both cognitive (didactic) and technical (hands-on) milestones for each level of residency. These milestones may be completed earlier in residency training than is outlined in this document, but should not be completed any later than described. We strongly recommend completing this curriculum by PGY-4 to maximize learning and skills acquisition. Programs should track residents' progress by documenting when each level of the curriculum is completed. Existing off-the-shelf educational resources are listed for the cognitive content, and a variety of options are given for obtaining hands-on skills. Proficiency-based performance metrics are also built into the curriculum to provide a more accurate basis of technical mastery beyond simply counting case numbers.

**Required Resources:** This curriculum assumes that each surgical residency program has available to it experts in flexible GI endoscopy. These experts may be surgical endoscopists or gastroenterologists, although it is expected over time that the program will recruit or train surgical endoscopists to conduct the training of surgery residents. Training programs should also have flexible endoscopy simulators (inanimate, animate or computer-based) available as part of its skills training lab. Finally, each residency program should provide a concentrated clinical rotation in flexible GI endoscopy. The duration of this rotation may vary, but it is recommended for it to be at least one month in length. During this rotation, residents should participate in the evaluation and management of patients with GI diseases as well as perform endoscopic procedures. This concentrated clinical rotation in flexible GI endoscopy may be “embedded” in a GI or general surgical rotation, such as upper GI surgery, colorectal surgery, or rural surgery, provided there is a sufficient volume of endoscopy to satisfy the requirements of this curriculum and an endoscopist who will be accountable for the quality of the experience.

## LEVEL I

*(Typically completed in PGY-1 or -2)*

The majority of the early stages of this curriculum are dedicated to didactic materials so as to provide a basic understanding of GI diseases and the anatomy of the GI tract as perceived by flexible endoscopic techniques. The modules available on the SCORE® Portal (Surgical Council on Resident Education; [www.surgicalcore.org](http://www.surgicalcore.org)) are an excellent source for this material and relevant SCORE content has been mapped to the curriculum and provided in Appendix A. The hands-on portion involves simulation-based training using either inanimate models, computer-generated simulation, or a clinical tutorial experience geared toward the novice resident. Further clinical exposure to flexible endoscopy will occur after this initial introduction to basic scope mechanics.

**Cognitive Milestones:** Basic understanding of GI diseases and endoscopic GI anatomy

*Materials:*

Recommended materials for this level are found in [Appendix A](#)

**Technical Milestones:** Simulation or clinical tutorial exposure with an emphasis on basic scope manipulation including one-handed wheel deflection, control of suction, irrigation, and insufflation, and passage of instruments through the working channel

*Equipment:*

1. Inanimate trainers used with real endoscopes
2. Virtual reality endoscopy simulators *(if available)*

Recommended equipment for this level are found in [Appendix A](#)

## LEVEL II

*(Typically completed in PGY-1 or -2)*

The cognitive milestones in this level focus on understanding flexible endoscope function, including setup, troubleshooting, and maintenance of the equipment. Residents may also continue training with simulation tools or, alternatively, a clinical tutorial may serve for learning these functions.

**Cognitive Milestones:** Basic understanding of flexible endoscope function

1. Characteristics of endoscopes
  - a. Fiberoptic components
  - b. Videoendoscopic components
  - c. Image capture
  - d. Channels
  - e. Tip control
2. Equipment setup
  - a. Cart
  - b. Umbilical cable
  - c. Equipment setup steps
  - d. Equipment testing
3. Troubleshooting
4. Equipment care
  - a. Maintenance
  - b. Cleaning

*Materials:*

Recommended materials for this level are found in [Appendix A](#)

**Technical Milestones:** Simulation or clinical exposure with demonstration of proper endoscope setup and function, troubleshooting of common problems, and a continued emphasis on basic scope manipulation

*Equipment:*

1. Inanimate trainers used with real endoscopes
2. Virtual reality endoscopy simulators *(if available)*

Recommended equipment for this level are found in [Appendix A](#)

## LEVEL III

*(Typically completed in PGY-2 or -3)*

During the junior experience, residents take a direct role in patient preparation, performance of endoscopy, and postoperative management. The cognitive milestones include bowel prep; moderate sedation; identification of pathology; management of findings; complication avoidance; and complication management. A dedicated one-month flexible endoscopy rotation is typically completed during this time, which may be completed on a GI medicine or general surgical service as described earlier under *Required Resources*. Additional clinical experiences may be added as part of other gastrointestinal surgical rotations.

Residents will be trained in basic upper and lower endoscopy, augmenting their endoscopy suite experience with cases in the ICU and operating room. Technical progress is assessed during this block using the Global Assessment of Gastrointestinal Endoscopic Skills (GAGES). GAGES scores should be recorded for residents at baseline and then at least intermittently through the course of their endoscopic experience. The goal is for residents to consistently achieve a GAGES score of  $\geq 18$  during their procedures. There should also be exposure to multidisciplinary GI meetings such as pathology conferences and GI conferences.

**Cognitive Milestones:** Indications and contraindications of upper and lower flexible endoscopy, periprocedural patient management

1. Prepare patient for procedure
  - a. Informed consent
  - b. Bowel preparation
  - c. Management of anticoagulants and antiplatelet medications
  - d. Management of cardiac rhythm devices
  - e. Periprocedural antibiotics
2. Understand principles of moderate sedation
3. Understand the appropriate and safe use of endoscopy
  - a. Indications
  - b. Contraindications
  - c. Recognition and management of normal and abnormal findings

*Materials:*

Recommended materials for this level are found in [Appendix A](#)

**Technical Milestones:** Simulation exposure or clinical tutorial, dedicated endoscopy experience, intraoperative endoscopy, ICU endoscopy

*Equipment and Resources:*

1. Inanimate trainers used with real endoscopes
2. Virtual reality endoscopy simulators *(if available)*

3. Clinical experience
  - a. Dedicated endoscopy rotation
  - b. Intraoperative endoscopy
  - c. ICU endoscopy
  - d. Endoscopy as part of a GI surgery service
4. Global Assessment of Gastrointestinal and Endoscopic Skills (GAGES)
  - a. [Appendix C](#)

## LEVEL IV

*(Typically completed in PGY-3 or -4)*

This initial senior experience encompasses improvements in both cognitive and technical skills with cases assessed using GAGES to achieve a minimum score of 18 for both upper and lower endoscopy — a score achieved by “experienced” endoscopists during the GAGES validation studies. Residents continue with more advanced cognitive modules for therapeutic endoscopic techniques. Clinical experience for residents, outside of their dedicated endoscopy experience, should take place in the operating room and ICU, and continued work in the endoscopy suite of the home institution or other affiliated or associated institutions is encouraged.

**Cognitive Milestones:** Image differentiation of normal/abnormal pathology, understanding intraoperative and postoperative GI anatomy, appropriate use of endoscopy

1. Recognition and management of complications
2. Outcomes measures

*Materials:*

Recommended materials for this level are found in [Appendix A](#)

**Technical Milestones:** Intraoperative endoscopy, ICU endoscopy, continued endoscopic experience

*Requirement:*

Endoscopy cases assessed using GAGES to achieve a minimum score of 18 ([Appendix C](#))



## LEVEL V

*(Typically completed in PGY-4 or -5)*

This part of the senior experience prepares the resident for postgraduate clinical practice in endoscopy with exposure to the tools/adjuncts for therapeutic endoscopic interventions. During this final experience, residents will have two additional requirements beyond Level IV:

1. Attain procedural numbers per Residency Review Committee for Surgery (RRC-Surgery) requirements
2. Obtain certification in Fundamentals of Endoscopic Surgery™ (FES)

**Cognitive Milestones:** Tools/adjuncts for therapeutic endoscopy

*Materials:*

Recommended materials for this level are found in [Appendix A](#)

**Technical Milestones:** Intraoperative endoscopy, ICU endoscopy, continued endoscopic experience. In this module any skills listed under the description of a *surgical endoscopist* (page 3) that have not been mastered should be performed until a GAGES score of 18 or greater is achieved.

*Requirements:*

1. Endoscopy cases to fill out spectrum of procedures performed by a surgical endoscopist assessed using GAGES to achieve a score of 18 or greater ([Appendix C](#))
2. Attain RRC-Surgery procedural number requirements  
[http://www.acgme.org/acgmeweb/Portals/0/440\\_GS\\_DefinedCategoryMinimumNumbers.pdf](http://www.acgme.org/acgmeweb/Portals/0/440_GS_DefinedCategoryMinimumNumbers.pdf)
3. Obtain FES certification  
<http://www.fesprogram.org>

## APPENDIX A

### Suggested Cognitive and Technical Resources

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#### LEVEL I (Typically PGY-1 or -2)

#### **Cognitive Resources**

##### *SCORE*

1. Esophagogastroduodenoscopy Module  
(<http://www.surgicalcore.org/modulecontent/130707>)
  - a. Indications and contraindications
    - i. <http://www.surgicalcore.org/chapter/180195#180197>
  - b. Pertinent anatomy
    - i. <http://www.surgicalcore.org/chapter/180195#180199>
2. Colonoscopy Module (<http://www.surgicalcore.org/modulecontent/130830>)
  - a. Indications and contraindications
  - b. Pertinent anatomy
    - i. <http://www.surgicalcore.org/chapter/180195#180202>

#### **Technical Resources**

1. Inanimate trainers used with real endoscopes
  - a. ACS/APDS Phase I Surgical Skills Curriculum
    - i. <http://www.facs.org/education/surgicalsills.html>
2. Computer-based simulator training

## **LEVEL II**

**(Typically PGY-1 or -2)**

### **Cognitive Resources**

#### *SCORE*

1. Esophagogastroduodenoscopy Module  
(<http://www.surgicalcore.org/modulecontent/130707>)
  - a. Endoscopic history
    - i. <http://www.surgicalcore.org/chapter/180195#180196>
  - b. Endoscope structure
    - i. <http://www.surgicalcore.org/chapter/180195#180198>
  - c. Advancements in imaging technology
    - i. <http://www.surgicalcore.org/chapter/180195#180199>
  - d. Equipment setup, technology, and EGD technique
    - i. Video
      1. <http://www.surgicalcore.org/videoplayer/510000113>
      2. <http://www.surgicalcore.org/videoplayer/510000080>
2. Colonoscopy
  - a. Instrumentation
    - i. <http://www.surgicalcore.org/chapter/180195#180198>
  - b. Advanced imaging
    - i. <http://www.surgicalcore.org/chapter/180195#180199>
  - c. Technique
    - i. Video
      1. <http://www.surgicalcore.org/videoplayer/510000114>

#### *FES*

- (<http://www.fesdidactic.org>)
1. Module 1: Technology
    - a. Characteristics of Endoscopes
    - b. Equipment Setup
    - c. Troubleshooting
    - d. Equipment Care
  2. Module 4: Upper Gastrointestinal Endoscopy
    - a. Indications
    - b. Preparation
    - c. Diagnostic EGD
    - d. Complications
  3. Module 5: Lower Gastrointestinal Endoscopy
    - a. Indications
    - b. Preparation

## Textbooks

### 1. Technology

#### a. Topics

- i. Characteristics of Endoscopes
- ii. Equipment Setup
- iii. Troubleshooting
- iv. Equipment Care

#### b. Reading Options

- i. *The SAGES Manual, Second Edition*
  1. Chapter 47 – Flexible endoscopes: characteristics, troubleshooting, and equipment care
  2. Chapter 48 – Endoscope handling
- ii. *Principles of Flexible Endoscopy for Surgeons*
  1. Chapter 2 – Basic components of flexible endoscopes
  2. Chapter 3 – Setup and care of endoscopes
- iii. *Practical Gastrointestinal Endoscopy, Sixth Edition*
  1. Chapter 1 – The endoscopy unit and staff
  2. Chapter 2 – Endoscopic equipment

### 2. Upper Gastrointestinal Endoscopy

#### a. Topics

- i. Indications
- ii. Preparation
- iii. Diagnostic EGD
- iv. Complications

#### b. Reading Options

- i. *The SAGES Manual, Second Edition*
  1. Chapter 50 – Diagnostic upper gastrointestinal endoscopy
  2. Chapter 58 – Complications of upper gastrointestinal endoscopy
- ii. *Principles of Flexible Endoscopy for Surgeons*
  1. Chapter 16 – Techniques of upper endoscopy
- iii. *Practical Gastrointestinal Endoscopy, Sixth Edition*
  1. Chapter 4 – Upper endoscopy: diagnostic techniques
- iv. *Successful Training in Gastrointestinal Endoscopy*
  1. Chapter 4 – Esophagogastroduodenoscopy (EGD)

### 3. Lower Gastrointestinal Endoscopy

#### a. Topics

- i. Indications
- ii. Preparation

#### b. Reading Options

- i. *The SAGES Manual, Second Edition*
  1. Chapter 70 – Diagnostic colonoscopy
- ii. *Principles of Flexible Endoscopy for Surgeons*
  1. Chapter 17 – Techniques and tips for lower endoscopy
- iii. *Practical Gastrointestinal Endoscopy, Sixth Edition*
  1. Chapter 6 – Colonoscopy and flexible sigmoidoscopy
- iv. *Successful Training in Gastrointestinal Endoscopy*
  1. Chapter 5 – Colonoscopy

### **Technical Resources**

1. Inanimate trainers used with real endoscopes
  - a. ACS/APDS Phase I Surgical Skills Curriculum
    - i. <http://www.facs.org/education/surgicalskills.html>
2. Computer-based simulator training

## **LEVEL III**

**(Typically PGY-2 or -3)**

### **Cognitive Resources**

#### *SCORE*

1. Esophagogastroduodenoscopy Module  
(<http://www.surgicalcore.org/modulecontent/130707>)
  - a. Basic upper endoscopy (<http://www.surgicalcore.org/chapter/180195>)
    - i. Indications
    - ii. Contraindications
    - iii. Assessment and monitoring
    - iv. Technique of upper endoscopy
    - v. Complications of EGD
  - b. Diagnostic upper endoscopy (<http://www.surgicalcore.org/chapter/180195>)
    - i. Indications
    - ii. Patient preparation
    - iii. Performance of diagnostic EGD with normal anatomy
    - iv. Postoperative stomach anatomy
    - v. Tissue sampling techniques
2. Colonoscopy Module (<http://www.surgicalcore.org/modulecontent/130830>)
  - a. Steps of procedure
    - i. <http://www.surgicalcore.org/chapter/180195#180202>
  - b. Therapy during colonoscopy
    - i. <http://www.surgicalcore.org/chapter/180195#180203>
3. Enteral Access
  - a. PEG
    - i. Video
      1. <http://www.surgicalcore.org/videoplayer/510000164>
      2. <http://www.surgicalcore.org/videoplayer/510000108>

#### *FES*

(<http://www.fesdidactic.org>)

1. Module 2: Patient Preparation
  - a. Informed Consent
  - b. Anesthesia Risk Assessment
  - c. Bowel Preparation
  - d. Prophylactic Antibiotic Therapy
  - e. Management of Anticoagulation
2. Module 3: Sedation and Analgesia
  - a. Monitoring

- b. Conscious Sedation
  - c. Medications
  - d. Recovery
  - e. Alternative Sedation
  - f. Small Caliber Endoscopy
3. Module 6: Performing Lower GI Procedures
- a. Diagnostic Colonoscopy
  - b. Rigid Endoscopy
  - c. Lower GI Endoscopy
  - d. Important Considerations
4. Module 10: Tissue Removal
- a. Resective Techniques
  - b. Sampling Techniques
  - c. Ablative Techniques
5. Module 11: Enteral Access
- a. Preparation
  - b. Indications
  - c. PEG
  - d. Procedures with PEJ
  - e. Replacement
  - f. Complications

### *Textbooks*

1. Patient Preparation, Sedation, and Analgesia
- a. Topics
    - i. Informed Consent
    - ii. Anesthesia Risk Assessment
    - iii. Bowel Preparation
    - iv. Prophylactic Antibiotic Therapy
    - v. Management of Anticoagulation
    - vi. Monitoring
    - vii. Conscious Sedation
    - viii. Medications
    - ix. Recovery
    - x. Alternative Sedation
  - b. Reading Options
    - i. *The SAGES Manual, Second Edition*
      - 1. Chapter 49 – Monitoring, sedation, and recovery
    - ii. *Principles of Flexible Endoscopy for Surgeons*
      - 1. Chapter 4 – Pre-procedural considerations

2. Chapter 5 – Intra-procedural considerations
      3. Chapter 6 – Post-procedural considerations
    - iii. *Practical Gastrointestinal Endoscopy, Sixth Edition*
      1. Chapter 3 – Patient care, risks and safety
  2. Performing Lower GI Procedures
    - a. Topics
      - i. Colonoscopy, diagnostic and therapeutic
      - ii. Rigid Endoscopy
      - iii. Tissue Removal
        1. Resection Techniques
        2. Sampling Techniques
        3. Ablative Techniques
    - b. Reading Options
      - i. *The SAGES Manual, Second Edition*
        1. Chapter 71 – Therapeutic colonoscopy and its complications
      - ii. *Principles of Flexible Endoscopy for Surgeons*
        1. Chapter 7 – Endoscopic tools/techniques for tissue sampling
        2. Chapter 9 – Endoscopic tools and techniques for tissue removal and ablation
      - iii. *Practical Gastrointestinal Endoscopy, Sixth Edition*
        1. Chapter 7 – Therapeutic colonoscopy
      - iv. *Successful Training in Gastrointestinal Endoscopy*
        1. Chapter 11 – Principles of electrosurgery
        2. Chapter 20 – Complicated polypectomy
  3. Enteral Access
    - a. Topics
      - i. Preparation
      - ii. Indications
      - iii. PEG
      - iv. Procedures with PEJ
      - v. Replacement
      - vi. Complications
    - b. Reading Options
      - i. *The SAGES Manual, Second Edition*
        1. Chapter 57 – Percutaneous endoscopic feeding tube placement
      - ii. *Principles of Flexible Endoscopy for Surgeons*
        1. Chapter 11 – Endoscopic techniques for enteral access
      - iii. *Practical Gastrointestinal Endoscopy, Sixth Edition*
        1. Chapter 5 – Therapeutic upper endoscopy



iv. *Successful Training in Gastrointestinal Endoscopy*

1. Chapter 29 – Enteral access techniques: percutaneous endoscopic gastrostomy and jejunostomy

**Technical Resources**

1. Inanimate trainers used with real endoscopes
  - a. ACS/APDS Phase I Surgical Skills Curriculum
    - i. <http://www.facs.org/education/surgicalsills.html>
2. Computer-based simulator training
3. Clinical experience
  - a. Dedicated endoscopy rotation
  - b. Intraoperative endoscopy
  - c. ICU endoscopy
  - d. Endoscopy as part of a GI surgery service
4. Global Assessment of Gastrointestinal and Endoscopic Skills (GAGES)
  - a. [Appendix C](#)

## LEVEL IV (Typically PGY-3 or -4)

### Cognitive Resources

#### SCORE

1. Therapeutic Endoscopy
  - a. Video: <http://www.surgicalcore.org/videoplayer/510000088>
    - i. Bleeding
      1. Variceal
      2. Nonvariceal
    - ii. Neoplasms
      1. Upper GI
      2. Colon
    - iii. Strictures
      1. Esophageal
      2. Duodenal
      3. Colonic

#### FES

(<http://www.fesdidactic.org>)

1. Module 7: Lower GI Anatomy, Pathology, and Complications
  - a. Pathology Recognition
  - b. Complications
2. Module 9: Hemostasis
  - a. Non-thermal Techniques
  - b. Thermal Techniques

#### Textbooks

1. Complications – Lower GI and other
  - a. Reading Options
    - i. *The SAGES Manual, Second Edition*
      1. Chapter 65 – Complications of endoscopic retrograde cholangiopancreatography (ERCP)
    - ii. *Principles of Flexible Endoscopy for Surgeons*
      1. Chapter 20 – Management of endoscopic complications
    - iii. *Practical Gastrointestinal Endoscopy, Sixth Edition*
      1. Covered within the procedure specific chapters
    - iv. *Successful Training in Gastrointestinal Endoscopy*
      1. No specific complications chapter
2. Hemostasis
  - a. Topics

- i. Nonthermal Techniques
- ii. Thermal Techniques
- b. Reading Options
  - i. *The SAGES Manual, Second Edition*
    - 1. Chapter 53 – Variceal banding
    - 2. Chapter 54 – Sclerotherapy
    - 3. Chapter 55 – Control of nonvariceal upper gastrointestinal bleeding
  - ii. *Principles of Flexible Endoscopy for Surgeons*
    - 1. Chapter 8 – Tools and techniques for gastrointestinal hemostasis
  - iii. *Practical Gastrointestinal Endoscopy, Sixth Edition*
    - 1. Chapter 5 – Therapeutic upper endoscopy – Page 74
  - iv. *Successful Training in Gastrointestinal Endoscopy*
    - 1. Chapter 11 – Principles of electrosurgery
    - 2. Chapter 15 – GI hemostasis

### **Technical Resources**

- 1. Inanimate trainers used with real endoscopes
- 2. Clinical experience
  - a. Dedicated endoscopy rotation
  - b. Intraoperative endoscopy
  - c. ICU endoscopy
  - d. Endoscopy as part of a GI surgery service
- 3. Global Assessment of Gastrointestinal and Endoscopic Skills (GAGES)
  - a. [Appendix C](#)

## **LEVEL V** **(Typically PGY-4 or -5)**

### **Cognitive Resources**

#### *UpToDate®*

1. ERCP
  - a. Indications, patient preparation, and complications
    - i. <http://www.uptodate.com/contents/endoscopic-retrograde-cholangiopancreatography-indications-patient-preparation-and-complications>

#### *FES*

(<http://www.fesdidactic.org>)

1. Module 8: Didactic Endoscopic Retrograde Cholangiopancreatography (ERCP)
  - a. Indications
  - b. Preparation
  - c. Performance of ERCP
  - d. Complications
  - e. Pathology Recognition
2. Module 12: Endoscopic Therapies
  - a. Dilation
  - b. Foreign Body Removal
  - c. Transgastric Laparoendoscopy
  - d. Choledochoscopy
  - e. Intraoperative Endoscopy
  - f. Tumor Localization

#### *Textbooks*

1. Diagnostic Endoscopic Retrograde Cholangiopancreatography (ERCP)
  - a. Topics
    - i. Indications
    - ii. Preparation
    - iii. Performance of ERCP
    - iv. Complications
    - v. Pathology Recognition
  - b. Reading Options
    - i. *The SAGES Manual, Second Edition*
      1. Chapter 61 – Endoscopic retrograde cholangiopancreatography
      2. Chapter 62 – Surgically altered anatomy and special considerations
      3. Chapter 63 – Cannulation and cholangiopancreatography
      4. Chapter 64 – Therapeutic ERCP
      5. Chapter 65 – Complications of ERCP

- ii. *Principles of Flexible Endoscopy for Surgeons*
    - 1. Chapter 19 – Techniques of ERCP
  - iii. *Successful Training in Gastrointestinal Endoscopy*
    - 1. Chapter 25 – ERCP management of complicated stone disease of the bile duct and pancreas
    - 2. Chapter 26 – ERCP management of malignancy: tissue sampling, metal stent placement, and ampullectomy
2. Endoscopic Therapies
- a. Topics
    - i. Dilation
    - ii. Foreign Body Removal
    - iii. Intraoperative Endoscopy
  - b. Reading Options
    - i. *The SAGES Manual, Second Edition*
      - 1. Chapter 52 – Therapeutic upper gastrointestinal endoscopy
    - ii. *Principles of Flexible Endoscopy for Surgeons*
      - 1. Chapter 10 – Endoscopic tools and techniques for strictures and stenosis
      - 2. Chapter 15 – Intraoperative endoscopy
    - iii. *Practical Gastrointestinal Endoscopy, Sixth Edition*
      - 1. Chapter 5 – Therapeutic upper endoscopy
        - a. Page 61
        - b. Page 66
        - c. Page 70
    - iv. *Successful Training in Gastrointestinal Endoscopy*
      - 1. Chapter 16 – Luminal dilation techniques
      - 2. Chapter 17 – Foreign body extraction

### **Technical Resources**

- 1. Inanimate trainers used with real endoscopes
- 2. Clinical experience
  - a. Intraoperative endoscopy
  - b. ICU endoscopy
  - c. Endoscopy as part of a GI surgery service
- 3. Global Assessment of Gastrointestinal and Endoscopic Skills (GAGES)
  - a. [Appendix C](#)
- 4. RRC-Surgery procedural number requirements
  - a. [http://www.acgme.org/acgmeweb/Portals/0/440\\_GS\\_DefinedCategoryMinimumNumbers.pdf](http://www.acgme.org/acgmeweb/Portals/0/440_GS_DefinedCategoryMinimumNumbers.pdf)
- 5. FES certification
  - a. <http://www.fesprogram.org>

## APPENDIX B

### Additional Recommended Readings – GI Disease

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*The following SCORE modules reflect the knowledge of GI diseases and their management that is fundamental to the understanding of GI endoscopy. These modules should be mastered over the course of a general surgery residency. These subjects are generally covered in the reading and conference schedules of most general surgery residencies in the U.S. and Canada.*

#### 1. Alimentary Tract – Esophagus

##### a. Broad

##### i. GERD / Barrett’s Esophagus Module

(<http://www.surgicalcore.org/modulecontent/127683>)

1. Pertinent Anatomy/Histology
2. Pertinent Physiology
3. Epidemiology
4. Prevention
5. Presentation
6. Diagnosis
7. Surgical Treatment (General Concepts)

##### ii. Hiatal Hernias Module (<http://www.surgicalcore.org/modulecontent/127763>)

1. Pertinent Anatomy/Histology
2. Presentation
3. Diagnosis
4. Staging/Grading
5. Surgical Treatment (General Concepts)
6. Nonsurgical Treatment, Including Alternative Treatments and Adjuvant Treatment
7. Outcomes Assessment

##### iii. Dysphagia

(<http://www.surgicalcore.org/modulecontent/135635>)

##### iv. Stricture

(<http://www.surgicalcore.org/modulecontent/167503>)

##### v. Achalasia

(<http://www.surgicalcore.org/modulecontent/164654>)

##### vi. Mallory-Weiss Syndrome

(<http://www.surgicalcore.org/modulecontent/135837>)

- b. Focused
  - i. Esophageal Neoplasms – Benign Module  
(<http://www.surgicalcore.org/modulecontent/145520>)
    - 1. Classification
    - 2. Leiomyoma
    - 3. Fibrolipomas and fibrovascular polyps
  - ii. Esophageal Neoplasms – Malignant Module  
(<http://www.surgicalcore.org/modulecontent/145580>)
    - 1. Overview
    - 2. Pertinent anatomy/histology
    - 3. Epidemiology
    - 4. Prevention
    - 5. Presentation
    - 6. Diagnosis (see “Overview” link)
    - 7. Staging/grading
    - 8. Palliation (see “Overview” link – page to bottom of chapter)
  - iii. Motility Disorders Other than Achalasia Module  
(<http://www.surgicalcore.org/modulecontent/161872>)
    - 1. Diffuse esophageal spasm
    - 2. Hypermotility
    - 3. Hypomotility
  - iv. Foreign Bodies Module  
(<http://www.surgicalcore.org/modulecontent/139060>)
  - v. Caustic Ingestion Module  
(<http://www.surgicalcore.org/modulecontent/159194>)
- 2. Alimentary Tract – Stomach
  - a. Broad
    - i. Gastric Ulcer Module  
(<http://www.surgicalcore.org/modulecontent/135983>)
      - 1. Pertinent Physiology
      - 2. Epidemiology
      - 3. Prevention
      - 4. Presentation
      - 5. Diagnosis
      - 6. Surgical Treatment (General Concepts)
      - 7. Nonsurgical Treatment, Including Alternative and Adjuvant Treatments
      - 8. Outcomes Assessment
    - ii. Duodenal Ulcer Module  
(<http://www.surgicalcore.org/modulecontent/135917>)

1. Pertinent Anatomy/Histology
    2. Pertinent Physiology
    3. Epidemiology
    4. Presentation
    5. Diagnosis
    6. Drug treatment
  - iii. Peptic Ulcer Disease with Bleeding Module  
(<http://www.surgicalcore.org/modulecontent/136046>)
  - iv. Peptic Ulcer Disease with Perforation Module  
(<http://www.surgicalcore.org/modulecontent/136114>)
  - v. Peptic Ulcer Disease with Obstruction Module  
(<http://www.surgicalcore.org/modulecontent/136173>)
  - vi. Gastric Neoplasms
    1. GIST and Miscellaneous Neoplasms Module  
(<http://www.surgicalcore.org/modulecontent/136240>)
    2. Lymphoma/Hodgkin's Disease Module  
(<http://www.surgicalcore.org/modulecontent/261623>)
  - vii. Gastric Cancer Module (<http://www.surgicalcore.org/modulecontent/128003>)
3. Alimentary Tract – Small Intestine
  - a. Broad
    - i. Polyps Module  
(<http://www.surgicalcore.org/modulecontent/137035>)
    - ii. GISTs Module  
(<http://www.surgicalcore.org/modulecontent/137280>)
    - iii. Crohn's Disease Module  
(<http://www.surgicalcore.org/modulecontent/128272>)
    - iv. Carcinoid Module  
(<http://www.surgicalcore.org/modulecontent/137202>)
    - v. Adenocarcinoma Module  
(<http://www.surgicalcore.org/modulecontent/137077>)
4. Alimentary Tract – Large Intestine
  - a. Broad
    - i. Polyps Module  
(<http://www.surgicalcore.org/modulecontent/129253>)
    - ii. Diverticulitis Module  
(<http://www.surgicalcore.org/modulecontent/129030>)



- iii. Cancer Module  
(<http://www.surgicalcore.org/modulecontent/129337>)
  - iv. Bleeding Module  
(<http://www.surgicalcore.org/modulecontent/128753>)
  - v. Lower Gastrointestinal Bleeding Module  
(<http://www.surgicalcore.org/modulecontent/128753>)
  - vi. C-Difficile Associated Diarrhea Module  
(<http://www.surgicalcore.org/modulecontent/136870>)
  - vii. Crohn’s Disease Module  
(<http://www.surgicalcore.org/modulecontent/136520>)
  - viii. Ulcerative Colitis Module  
(<http://www.surgicalcore.org/modulecontent/129440>)
  - ix. Ischemic Colitis Module  
(<http://www.surgicalcore.org/modulecontent/136797>)
  - x. Appendiceal Neoplasms Module  
(<http://www.surgicalcore.org/modulecontent/136661>)
5. Alimentary Tract – Anorectal
- a. Broad
    - i. Hemorrhoids Module  
(<http://www.surgicalcore.org/modulecontent/130010>)
    - ii. Rectal Cancer Module  
(<http://www.surgicalcore.org/modulecontent/130244>)
    - iii. Anal Cancer Module  
(<http://www.surgicalcore.org/modulecontent/135579>)
    - iv. Perianal Condylomas Module  
(<http://www.surgicalcore.org/modulecontent/167798>)
      - 1. Anorectal warts  
(<http://www.surgicalcore.org/chapter/182925#182969>)
      - 2. Benign and malignant rectal, anal and perineal problems  
(<http://www.surgicalcore.org/chapter/69381>)
      - 3. Anorectal disorders
  - b. Focused
    - i. Anal Dysplasia / Sexually Transmitted Diseases Module  
(<http://www.surgicalcore.org/modulecontent/164833>)
      - 1. Sexually transmitted diseases of the anorectum
      - 2. Benign and malignant rectal, anal and perineal problems  
(<http://www.surgicalcore.org/chapter/69381>)
      - 3. Anorectal disorders



# GAGES - UPPER GI ENDOSCOPY SCORESHEET

## GLOBAL ASSESSMENT OF GASTROINTESTINAL ENDOSCOPIC SKILLS

### INTUBATION OF THE ESOPHAGUS

SCORE

Reflects patient management, understanding of anatomy and sedation

- 5 Able to independently (successfully) intubate esophagus without patient discomfort
- 4
- 3 Requires detailed prompting and cues
- 2
- 1 Unable to properly intubate requiring take over

### SCOPE NAVIGATION

SCORE

Reflects navigation of the GI tract using tip deflection, advancement/withdrawal and torque

- 5 Expertly able to manipulate the scope in the upper GI tract autonomously.
- 4
- 3 Requires verbal guidance to completely navigate the upper GI tract
- 2
- 1 Not able to achieve goals despite detailed verbal cues, requiring take over

### ABILITY TO KEEP A CLEAR ENDOSCOPIC FIELD

SCORE

Utilization of insufflation, suction and/or irrigation to maximize mucosal evaluation

- 5 Uses insufflation, suction, and irrigation optimally to maintain clear view of endoscopic field
- 4
- 3 Requires moderate prompting to maintain clear view
- 2
- 1 Inability to maintain view despite extensive verbal cues

### INSTRUMENTATION (if applicable; leave blank if not applicable)

SCORE

Random biopsy: targeting is assessed by asking the endoscopist to take another biopsy from the identical site. Targeted instrumentation: evaluation is based on ability to direct the instrument to the target.

- 5 Expertly directs instrument to desired target
- 4
- 3 Requires some guidance and/or multiple attempts to direct instrument to target
- 2
- 1 Unable to direct instrument to target despite coaching

### QUALITY OF EXAMINATION

SCORE

Reflects attention to patient comfort, efficiency, and completeness of mucosal evaluation

- 5 Expertly completes the exam efficiently and comfortably
- 4
- 3 Requires moderate assistance to accomplish a complete and comfortable exam
- 2
- 1 Could not perform a satisfactory exam despite verbal and manual assistance requiring takeover of the procedure



# GAGES - COLONOSCOPY SCORESHEET

## GLOBAL ASSESSMENT OF GASTROINTESTINAL ENDOSCOPIC SKILLS

### SCOPE NAVIGATION

SCORE

Reflects navigation of the GI tract using tip deflection, advancement/withdrawal and torque

- 5 Expertly able to manipulate the scope in the GI tract autonomously
- 4
- 3 Requires verbal guidance to completely navigate the lower GI tract
- 2
- 1 Not able to achieve goals despite detailed verbal guidance requiring takeover

### USE OF STRATEGIES

SCORE

Examines use of patient positions, abdominal pressure, insufflation, suction and loop reduction to comfortably complete the procedure

- 5 Expert use of appropriate strategies for advancement of the scope while optimizing patient comfort
- 4
- 3 Use of some strategies appropriately, but requires moderate verbal guidance
- 2
- 1 Unable to utilize appropriate strategies for scope advancement despite verbal assistance

### ABILITY TO KEEP A CLEAR ENDOSCOPIC FIELD

SCORE

Utilization of insufflation, suction and/or irrigation to maximize mucosal evaluation

- 5 Uses insufflation, suction, and irrigation optimally to maintain clear view of endoscopic field
- 4
- 3 Requires moderate prompting to maintain clear view
- 2
- 1 Inability to maintain view despite extensive verbal cues

### INSTRUMENTATION (if applicable; leave blank if not applicable)

SCORE

Random biopsy: targeting is assessed by asking the endoscopist to take another biopsy from the identical site. Targeted instrumentation: evaluation is based on ability to direct the instrument to the target.

- 5 Expertly directs instrument to desired target
- 4
- 3 Requires some guidance and/or multiple attempts to direct instrument to target
- 2
- 1 Unable to direct instrument to target despite coaching

### QUALITY OF EXAMINATION

SCORE

Reflects attention to patient comfort, efficiency, and completeness of mucosal evaluation

- 5 Expertly completes the exam efficiently and comfortably
- 4
- 3 Requires moderate assistance to accomplish a complete and comfortable exam
- 2
- 1 Could not perform a satisfactory exam despite verbal and manual assistance requiring takeover of the procedure

OVERALL SCORE: