Chapter 6
Advanced Training and Certifications in Endoscopy

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Introduction

The landscape of endoscopy is rapidly evolving with the development of new devices, technologies, and techniques as the endoscopic treatment of any disease requires technical skill, in addition to a thorough understanding of pathophysiology. Appropriate gastrointestinal (GI) endoscopy training through either GI or surgical fellowship is critical. The skillset and degree of training required for these advanced endoscopic procedures will vary based on multiple factors, including but not limited to the complexity of the technique and the trainee's skill. This chapter will review the expansive array of

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endoscopic interventions and the existing frameworks for defining and measuring competence during training to ultimately attain certification for performing these procedures.

Training in Endoscopy

The Society of American Gastrointestinal Endoscopic Surgeons (SAGES) and the American Society of Colon and Rectal Surgeons (ASCRS) partnered with the American Society for Gastrointestinal Endoscopy (ASGE) to establish training guidelines for endoscopy in 2002 [1, 2]. The joint statement reflected that acquisition of endoscopic skills should be in the context of training programs in either GI or surgery.

The ASGE later updated these guidelines in 2017 and, along with other medical and surgical digestive disease organizations, have led to the development of Standards of Practice of Gastrointestinal Endoscopy and a statement of Principles of Endoscopic Training [2]. These recommendations state that formal structured residency or fellowship training in endoscopy is necessary, with documentation of skills and competence.

While traditional postgraduate training in advanced endoscopic techniques has focused on endoscopic retrograde cholangiopancreatography (ERCP) and diagnostic endoscopic ultrasound (EUS), the increasing demand for therapeutic endoscopy has led to a considerable expansion in the breadth of training. More GI and surgical trainees are attaining exposure to numerous other procedures, including but not limited to luminal stenting, ablative therapies, endoscopic bariatric and metabolic therapies (EBMT), therapeutic EUS, and advanced tissue resection, and "third space" endoscopy. While the primary mission of all GI and surgical societies is to promote high-quality patient care by ensuring competence in endoscopy, training and skills assessment remain variable across the country [2–6].

Defining Competence

Several quality indicators have been selected to establish competence in performing more basic endoscopic procedures. For example, in colonoscopy, intubation of the cecum and a detailed mucosal inspection contribute to the definition of competence in terms of technical success. The ASGE suggests that effective practicing colonoscopists should be able to intubate the cecum in >90% of all cases and>95% of cases when the indication is screening a healthy adult. Furthermore, careful mucosal inspection is essential to effective colorectal cancer prevention and reduction of cancer mortality. The rate of detection of neoplastic and pre-neoplastic lesions, i.e., adenoma detection rate (ADR), is the primary goal of most colonoscopic examinations [7].

Training and competency assessment in advanced endoscopic procedures, on the other hand, have traditionally been based on an apprenticeship model. As such, the volume of cases through both observation and performance of procedures under supervision has commonly been used as a surrogate for assessing competence. Despite extensive attempts to identify and validate minimal procedural numbers necessary for defining competence, thresholds between publications have varied tremendously. This variability is highlighted in the ERCP literature, which contains many flaws in using volume as a marker of procedural competence, including defining performance of only a single intervention (such as biliary cannulation) and the lack of recognition that trainees learn skills at variable rates and have different educational backgrounds [2, 8–14]. For example, proceduralists with an extensive surgical or advanced endoscopy background may not require the same volume of cases in learning a new technique as a provider who only focuses on general endoscopy. There is also variability in the teaching trainees receive from faculty, which invariably plays a role.

Thus, the previously adopted dictum of “see one, do one, teach one” is now considered obsolete and replaced by a shift

toward competency-based medical education [15]. While minimal threshold numbers are integral to training, they do not guarantee competence.

Many of the principles for introducing new technology and techniques in the surgical literature may apply to endoscopic interventions. Guidelines published in 2014 by SAGES based on a systematic review of published literature and expert opinion reported a majority agreement that familiarization, cognitive training, hands-on practice, performance assessment, patient disclosure, and outcome monitoring were necessary steps to ensure competence during the introduction of a new device or surgical technique [16]. A strong recommendation was made for the device- or procedure-specific training to decrease the learning curve-related complications and thus improve safety. Furthermore, the necessary training steps were dependent on the degree of novelty/change and could include a variety of different components, including but not limited to video review, cadaveric training models, course participation at society meetings, and proctoring [16].

The ASGE has defined competence as the "minimum level of skill, knowledge, and/or expertise, derived through training and experience, required to safely and proficiently perform a task or procedure" [2]. A given individual's level of exposure and engagement during or after training to a specific procedure or skillset should help dictate whether that provider is competent to perform procedures independently. Defining competence in endoscopy must be procedure-specific, starting with the identification of core skills and establishing quality metrics and benchmarks for a given technique. Commonly performed advanced endoscopic procedures and standardization measurement tools that aim at providing quantitative and qualitative assessment in endoscopic training will be reviewed below. It is important to recognize that some of the presented suggestions are based on expert opinion, and robust data to substantiate many of the training recommendations are lacking.

Ablative Therapies

Commonly used ablative techniques include radiofrequency ablation (RFA), argon plasma coagulation (APC), and cryotherapy. These are primarily used for esophageal dysplastic lesions and early-stage malignancy, gastric antral vascular ectasia (GAVE), and for treatment of radiation proctitis.

In order to safely and effectively perform these procedures, trainees must first seek to master the cognitive component of these interventions [3]. For example, it is essential to understand the role of RFA after EMR of superficial cancers with remnant dysplastic mucosa. The technical component includes learning and understanding the technical equipment (devices and accessories) used in each of these ablative techniques. For example, it is critical to characterize columnar lined esophagus (Barrett's esophagus) prior to intervention, use a mucolytic agent if necessary, and understand whether to remove eschar in between treatments depending on the procedure being performed. Cognitive and technical competency is particularly important with these types of advanced endoscopic procedures.

Endoscopic Bariatric and Metabolic Therapies (EBMTs)

EBMTs encompass a broad array of procedures, including primary weight-loss interventions and treatment of adverse events after bariatric surgery. Endoscopic devices and techniques are rapidly evolving in this space, several of which have demonstrated safety and efficacy in prospective randomized controlled trials. These interventions have markedly increased in popularity over the last several years, leading to a growing number of endoscopists seeking training in these procedures.

A position statement authored by the Association of Bariatric Endoscopy (ABE)/ASGE on training and privileges in EBMT described three essential principles for the provision of quality therapies [6]. These principles include a broad and in-depth understanding of the management of patients with obesity, mastery of GI endoscopic skills, and procedure- and device-specific knowledge necessary to provide specific EBMTs and manage potential associated adverse events. Endoscopists interested in learning EBMT must have a comprehensive knowledge of the indications, contraindications, risks, benefits, and outcomes. Both the ASGE and the American Society for Metabolic and Bariatric Surgery (ASMBS) emphasize that EBT should not be carried out in isolation and that endoscopists performing EBMT should be part of a multidisciplinary comprehensive obesity program.

Similar to other emerging technologies, there is a paucity of data regarding training requirements in EBMT. The ASGE suggests that focused training via dedicated courses are potential settings to gain further expertise in certain aspects of EBMT. Many of these courses are sponsored and organized by industry, which plays a vital role in the training and education of these new devices. Moreover, EBMTs of greater complexity may require proctoring and a structured training program [17, 18]. Furthermore, due to the spectrum of requisite technical skill and procedural risk, privileges may be granted on a procedure-specific basis with the demonstration of competency.

"Third space" Endoscopy

Third-space endoscopy is also known as intramural or submucosal endoscopy. This field is based on the concept that the deeper layers of the GI tract can be approached via the submucosal space and has led to widespread dissemination of procedures such as endoscopic submucosal dissection (ESD) and per-oral endoscopic myotomy (POEM).

ESD

ESD was first described in Japan as a minimally invasive strategy for the management of early gastric cancer. Over time, this technique has evolved to include resection of lesions in other parts of the GI tract, including the esophagus, small bowel, and colon.

There is a steep learning curve to training in ESD. In Japan, trainees traditionally followed a master–apprentice model, but this approach is not easily translatable in Western countries [2, 5]. Trainees should be supervised by experts and should have focused fellowships dedicated to this technique before performing complex endoscopic procedures in humans independently. Furthermore, EMR skills should be a prerequisite to training in ESD, in addition to proficiency in advanced diagnostic techniques and endoscopic classification systems [4]. Hands-on training, even on animal models, is invaluable, with some guidelines proposing at least 20 procedures prior to performing ESD on humans [19].

The European Society of Gastrointestinal Endoscopy (ESGE) recently issued a position statement on training in ESD [19]. These guidelines contain a core curriculum that defines the skills and competence needed before ESD training, establishes minimum standards in order to perform ESD, and defines the necessary training program for proceduralists who want to include ESD in their practice. This model may be difficult to adopt in the USA, where cases are sporadic, even in specialized centers. Furthermore, endoscopists interested in ESD are often full-time interventional endoscopists at their own institutions, and travel arrangements for either the trainee or the proctor can be limited.

POEM

POEM is used to treat achalasia and other motility disorders of the esophagus and has quickly gained excitement throughout the advanced endoscopy community. Training in this pro-

cedure is complicated, given both the technical complexity and the knowledge to be able to manage significant adverse events.

The Japan Gastroenterological Endoscopy Society released clinical guidelines on training in POEM in 2017 [20]. This position statement recommends that initial skill acquisition be met through training on animal models, including organ and live models, and then ultimately progressing to observation followed by direct supervision and proctoring of live human cases by an experienced endoscopist. The number of procedures required to be competent in POEM is disputed in the literature, with a wide discrepancy on the learning curve ranging from 7 to 100 cases. This discrepancy again supports that emphasis should be shifted away from the number of procedures performed and toward well-defined and validated competency thresholds.

Future Directions

As the field of endoscopy evolves, the generation of robust data to substantiate many of the aforementioned training recommendations and standardization measurement tools for advanced endoscopic procedures will be important. Furthermore, the increasing complexity of emerging endoscopic interventions, in combination with an emphasis on competency-based medical education, will require a transformation of the curriculum to ensure adequate training without compromising best patient practices. Perhaps national consensus standards for endoscopic privileging of many of these advanced techniques should be required to standardize endoscopy practice and ensure that all patients are managed optimally.

Conclusion

The primary mission of all endoscopists is to promote high-quality patient care and safety in the field of GI and surgical endoscopy. With the increasing diversity and complexity of

emerging endoscopic interventions, there has been a shift from time or number-based training toward competency-based education. Learning curves vary among trainees of all stages, and a specific case volume does not ensure competence in performing these procedures. Furthermore, defining competence in endoscopy must be procedure-specific, starting with identifying core skills and establishing quality metrics and benchmarks for a given technique, as evidenced by the discussion of select interventions throughout this chapter. Surgical and GI endoscopists who desire to perform existing or new procedures should ensure adequate dedication of time to acquire technical and cognitive endoscopic skills, knowledge of endoscopic anatomy, comprehension of the pathophysiology of digestive diseases, and competency and proficiency of performance.

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