

# Endoscopy training in Korea

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It is essential to maintain high-quality endoscopy given the increasing number of endoscopic screens performed in Korea. The training of fellows to perform endoscopies is challenging. The rapid development of endoscopic techniques and rising patient complexity increase the training pressures. At the end of training, all practitioners must perform endoscopy safely and effectively. Here, we examine the current status of endoscopy training in Korea. Although our system produces many competent endoscopists, there is room for improvement. Formal training programs should be developed to train the trainers. Specific assessment tools measuring performance and improving training are required. Changes should be made at all levels to improve our endoscopy training system.

**Keywords:** Endoscopy; Education; Competency-based education

## INTRODUCTION

Endoscopic services are readily available in Korea, and the annual number of endoscopies is increasing [1]. It is essential to maintain high-quality endoscopy given the increasing number of endoscopic screens performed. Training in terms of routine procedures (esophagogastroduodenoscopy and colonoscopy) is usually imparted during gastroenterology programs 1 to 2 years in duration taken during a fellowship. The Korean Society of Gastrointestinal Endoscopy (KSGE) established goals and guidelines for trainee education in 2011 and recently updated them [2]. In 2018, 372 fellows commenced training in KSGE-certified programs, and 370 doctors applied to join the subspecialty board of gastrointestinal endoscopy. The training of fellows

to perform endoscopies is challenging. The training responsibilities fall upon individual program directors and their faculties. Usually, trainees study under one or two experienced endoscopists during their fellowships. Most experts lack formal training on how to teach endoscopy. Competency in endoscopy is currently confused with the ability to teach endoscopy; experience is not always accompanied by good teaching skills [3]. This is an important limitation of Korean training programs. Gastroenterology units should strive to ensure that trainees can perform esophagogastroduodenoscopy safely and effectively upon completion of training. Training programs should also include the principles of sedation/analgesia, how to obtain informed consent, and medical ethics [4]. Here, we discuss the current limitations of endoscopy training programs in Korea.

We also make practical suggestions for improvement.

## CURRENT STATUS OF ENDOSCOPY TRAINING IN KOREA

Currently, endoscopy training features an apprenticeship model. Trainees first observe and then assist experts performing various procedures. Then, trainees perform endoscopies on real patients with or without expert supervision. Trainees are expected to achieve a certain level of competency after a given number of endoscopies. This approach has the advantage that expert supervision and feedback are available. However, several limitations are apparent. First, one or two expert endoscopists are responsible for teaching and performing competency assessments of all trainees. Expert endoscopists are not compelled to receive education on how to teach. Second, training usually takes place during the clinical practice of experts, who are thus usually overloaded. Formal training curricula are lacking, and the level of training depends largely on the hospital hosting the trainee. Third, patients are exposed to discomfort and increased risks of adverse events until the trainee gains a sufficient level of competency.

## HOW TO CHANGE ENDOSCOPY TRAINING IN KOREA

Korea lacks a universal, comprehensive endoscopy teaching curriculum. Currently, overall trainee competency is gaged by their procedural volumes and subjective evaluations. Future training should focus on assessment of specific metrics and individual abilities [5]. This requires development of a new, formal, endoscopy teaching curriculum that clarifies the training goals, instruction methods, and assessment tools. An ideal training program should combine an online curriculum with assessment, live courses featuring hands-on training with formative evaluation and feedback, and post-training assessment of skills and knowledge [3]. These programs should optimize both the cognitive and technical skills required by endoscopists [6].

## DEVELOPMENT OF TRAINERS AND TRAINING PROGRAMS

Dividing an endoscopic technique into individual parts that are then comprehensively described is an essential feature of training. However, most trainers in Korea have never received formal training in teaching. Although most trainers want to be good teachers, many find it easier to demonstrate a procedure rather than to describe the constituent steps. Thus, formal training programs should aim to train the trainers in defining the components of endoscopic procedures and describing them to trainees. Trainers should be trained in assessment of trainee expertise and how to individualize the training of each trainee. Ideally, improving trainer quality should facilitate and shorten the duration of training.

## ASSESSMENT OF ENDOSCOPY TRAINING

Currently, trainee endoscopic skills are assessed based on the number of procedures performed and a qualifying examination [7]. Although these methods have produced excellent endoscopists, the assessment tools require improvement. The tools should objectively assess both trainer and trainee competence. Recently, researchers in Western countries have described several tools for assessment of endoscopic skills [8-10]. However, it is difficult to simply apply these indicators in Korea, because the disease prevalence differs greatly from that of Western countries. Simply measuring performance can improve endoscopic quality [11]. The KSGE recently published a revised version of endoscopic quality indicators for Korea [7]. However, the new edition still regards the number of procedures and the duration of education as markers of competency.

We need to develop specific tools measuring endoscopic performance to better train trainees. These tools should be simple and capable of being applied feasibly and regularly during clinical practice. Assessment of trainee performance would allow the various training programs to be compared. This should increase the general quality of endoscopists. The tools can also be used to help maintain the performance of clinical practitioners who have completed training.

## DEVELOPMENT OF TRAINING DEVICES

Simulator-based training has not been generally accepted in Korea; most clinical skills are acquired by directly practicing on patients. Many studies have shown that simulators improve skills and shorten the time taken to acquire competency, particularly during the early stages of training [12,13]. Simulators can also be used to assess trainee skills and competency [14]. Recently, box models of endoscopic simulators have been used in some Korean hospitals to train novice endoscopists. Some studies found that these devices rapidly improved skills [13,15]. Although the simulators may not reproduce the actual endoscopic experience, they facilitate the learning of specific endoscopic techniques such as how to handle the scope. Simulator-based training has reduced colonoscopy completion times and imparted better technical skills than has patient-based training [16]. Formal programs should be developed using these simulators; their widespread employment may shorten the learning process. In the future, virtual simulators and three-dimensional-printed organs may also be used for training [17,18]. Currently, such devices are rarely employed in most Korean training hospitals. We must become familiar with the simulators and prepare curricula incorporating their use.

## SEDATION TRAINING

Malpractice claims based on sedation-related complications are frequently reported in the media. We suspect that such claims constitute a significant proportion of medicolegal cases brought against Korean gastroenterologists. Therefore, future endoscopy training should include sedation practice [19]. Formal educational programs and tests are required to improve sedation competence. Trainees should be educated in pre-procedural patient assessment and preparation and patient monitoring during endoscopy [20]. They should be familiar with the doses and timings of the medications administered during the procedure. Trainees should also be trained in the management of adverse events and post-procedural patient monitoring [21]. Although data are lacking, most trainees receive little education on sedation during their fellowships. The KSGE pro-

vides both online training aids and formal training programs. However, these programs are not readily assessable; no validated method by which competency can be assessed is available. A systematic, thorough training program should be developed, along with methods measuring competency.

## FUTURE ASPECTS OF ENDOSCOPY TRAINING

Endoscopic technology is developing rapidly. Both trainees and trainers require regular updates on advances in endoscopic techniques. Image-enhanced endoscopy employing narrow-band imaging, flexible spectral imaging color enhancement, and the i-Scan were introduced in the early 2000s for diagnosis of gastrointestinal lesions [22,23]. Linked color imaging and blue laser imaging systems are the latest modalities that usefully identify upper gastrointestinal lesions [24]. These new imaging modalities greatly facilitate the diagnosis of gastrointestinal lesions and will become popular in the future [25]. Trainees must be familiar with the rapid developments in image-enhanced endoscopy.

Obesity now affects 13% to 39% of adults worldwide [26]. Endoscopic bariatric therapies have recently been developed to treat obesity [27]; these are not routinely included in training, but trainees should be familiar with the procedures. Training programs should include various management options for obesity (lifestyle therapies, medications, and bariatric endoscopy).

In the future, a fundamental shift in endoscopy training may be required given the developments in augmented, virtual, and mixed realities. Such technologies offer virtual environments indistinguishable from the real world [28]. VR has already been applied during surgery, reducing operative times and increasing overall performance [29]. Such technologies may allow trainees to practice endoscopy in a three-dimensional environment similar to that of real patients [30]. Although these technologies are currently not widely used in Korea, we should be prepared for future changes.

## CONCLUSIONS

In recent years, the focus of endoscopy training has

shifted away from the current time-based programs toward competency-based programs, based on the premise that trainees require high-quality training before they can perform high-quality endoscopy [31]. Korean endoscopists are subjected to increased public awareness and growing legal pressure. We must ensure that graduating trainees can perform endoscopy safely and effectively. The rapid developments in endoscopic techniques and increased patient complexity add to the pressure to educate trainees well. To date, no standard training method is available. A national training program/curriculum is required. Assessment tools objectively measuring performance should be used to ensure the competency of those who complete the programs. Improvement in our current training system will require effort, as changes are required at all levels.

**Conflict of interest**

No potential conflict of interest relevant to this article was reported.

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