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MINIREVIEWS

Achieving competence in colonoscopy: Milestones and the need for a new endoscopic curriculum in gastroenterology training

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Abstract

Colonoscopy is considered to be the most effective tool for reducing colorectal cancer (CRC) morbidity and mortality. As a result, certifying trainee competence in the performance of colonoscopy is critical to maximizing CRC screening and prevention efforts. Guidelines on training and accreditation around the world have been revised to emphasize the attainment of milestones in the technical and cognitive skills necessary to perform the procedure. To meet this challenge, new evaluation systems have been developed to measure trainee competence through all aspects of colonoscopy training. These changes stem from increased recognition that procedural numbers alone do not necessarily guarantee trainees' proficiency in the performance of colonoscopy. Variability in endoscopic practice and in CRC screening outcomes also point to deficiencies in the current approach towards colonoscopy instruction. However, technological innovations hold great promise in training endoscopists to perform high quality colonoscopy. Furthermore, potential advances in the use of feedback as a training tool provide new avenues for research. This review summarizes the latest evidence on the effort to define, evaluate and promote the achievement of competence in colonoscopy among trainees.

Key words: Competence; Colonoscopy; Colorectal cancer; Core curriculum; Cecal intubation

Core tip: The certification of competence among trainees in the performance of colonoscopy is currently evolving. Recent efforts are shifting the paradigm towards formal evaluation systems that emphasize core skills. Similar innovations in technology and teaching methods provide the push to re-define the future curriculum for colonoscopy training.

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INTRODUCTION

The process of determining if medical trainees possess the requisite knowledge and skill to practice the healing arts has played a central role in the evolution of medicine. In the time of the ancient Greeks and Romans, competence was based upon the judgment of the elder physician under whom the trainee served as an apprentice[1]. In 1260, the Mongol Emperor Kublai Khan established the first system of certification based upon the completion of formal written examinations[1]. With the founding of the Royal College of Physicians in London in 1518, a further shift towards formal medical licensure took place with the advent of both written tests and objective assessments of procedural skills[1].

In gastrointestinal endoscopy, the task of certifying competence among trainees is also evolving from an apprenticeship model towards a more objective process based upon the achievement of milestones. With nearly 14.2 million procedures performed in the United States alone[2], colonoscopy represents the most common endoscopic procedure performed by gastroenterologists, surgeons and family practitioners. However, recent studies suggest that the detection of adenomatous polyps and the development of missed interval colorectal cancers (CRCs) may be closely related to the proficiency of the endoscopist[3-5]. Consequently, the process by which trainees are trained and certified to be competent in the performance of colonoscopy has become a high priority.

To approach this vital issue, there are several salient questions to be asked: (1) What is competence; (2) Why does competence matter; (3) How do we determine trainee competence; (4) Do trainees currently attain competence; and (5) How do we help trainees to attain competence.

WHAT IS COMPETENCE?

Competence is defined by the American Society for Gastrointestinal Endoscopy (ASGE) as the "Minimal level of skills, knowledge and/or expertise derived through training and experience that is necessary to safely and proficiently perform a task or procedure"[6]. Competence is determined to be contingent upon: (1) Technical skills to safely perform the procedure; and (2) Cognitive skills to take information gained from a procedure and to place it in the appropriate clinical context[6]. These cognitive and technical skills are further broken down into basic and intermediate competencies (Table 1)[7].

Given that the end-goal of colonoscopy is to reduce CRC-related mortality, competence among trainees can also be defined based upon their ability to surpass quality thresholds. The ASGE defines these benchmarks as: (1) adenoma detection rate (ADR) of ≥ 30% in male and ≥ 20% in female patients undergoing average-risk CRC screening; (2) A successful cecal intubation of ≥ 90% in all colonoscopies and ≥ 95% for screening colonoscopy; (3) the successful removal of polyps < 2 cm in size; and (4) A colonoscopy withdrawal time of > 6 min[8]. In the United Kingdom, the Joint Advisory Group (JAG) on gastrointestinal (GI) endoscopy requires: (1) Cecal intubation rate of > 90%; (2) > 90% of rate of completing procedures without assistance; (3) Attendance at a basic skills colonoscopy course; and (4) Procedure total of ≥ 200[9].

WHY DOES COMPETENCE MATTER?

While the answer to this question may seem largely self-evident, the process of certification is salient to many potential interests regarding colonoscopy. First and foremost, endoscopist competence has been shown to have a significant impact on the effectiveness of colonoscopy in detecting and preventing CRC. Baxter *et al*[4] recently questioned the long-standing assumption that colonoscopy decreases CRC-related morbidity and mortality when they demonstrated that the procedure was not protective for right-sided CRC (OR = 0.99, 95%CI: 0.86-1.14). To potentially explain this observation, Singh *et al*[10] in a large population based study in Manitoba, Canada found that colonoscopy with polypectomy, cecal intubation failure and procedures performed by family practitioners were associated with the development of interval CRC within 3 years of an index colonoscopy. This raises the prospect that low levels of competence in polypectomy, cecal intubation and endoscopic training limit the effectiveness of colonoscopy. Furthermore, Kaminski *et al*[11] found that endoscopists with a mean ADR of < 11% had a cumulative hazard rate for the development of interval CRC of 10.94 (95%CI: 1.37-87.01) when compared with physicians who had an ADR of > 20%. A similar study by Corley *et al*[12], found that physicians who increased their ADR from the lowest quintile to the highest quintile prevented 1 interval CRC over the course of 10 years. Furthermore, they found that every 1.0% increase in ADR predicted a 3.0% decrease in the risk of interval cancer (HR = 0.97; 95%CI: 0.96-0.98)[12]. Given that ADR is one of the primary benchmarks for both competence and quality in colonoscopy, it is clear that the process of determining endoscopist proficiency plays a pivotal role in the effort to improve CRC prevention.

Finally, the issue of establishing competence among trainees is important because of recent studies that demonstrate that physician behavior is difficult to alter once an endoscopist is no longer a trainee. Sawhney *et al*[13] found that an institutional mandate to achieve a minimum withdrawal time (time spent from cecal intubation to removal of the colonoscope from the anus) among 42 attending endoscopists failed to produce any significant change in polyp detection rate (PDR). Lin *et al*[14] performed a similar study where they provided periodic feedback of patient satisfaction scores, average withdrawal time, and PDR every 3-6 mo to 10 attending gastroenterologists who were at least 8 years removed from training. One year after the implementation of this feedback mechanism, there was no significant increase

Table 1 American Society for Gastrointestinal Endoscopy Core Curriculum list of core motor and cognitive skills required to be competent in colonoscopy[7]

Motor	Cognitive
Correctly holding the colonoscope	Anatomy
Use of the colonoscopy controls	Patient selection
Colonoscope insertion	Preparation
Colonoscope advancement	Colonoscope selection
Tip control	Informed consent
Torque	Sedation management
Lumen identification	Assessment of indication and risks
Withdrawal/mucosal inspection	Pathology identification
Loop reduction	Therapeutic device settings
Angulated turns	Integration of findings into management plans
Terminal ileum intubation	Report generation and communication
Biopsy	Complication management
Snare polypectomy	Quality improvement
	Professionalism

in either PDR (33.1% *vs* 38.1%, P = 0.04) or ADR (19.6% *vs* 22.7%, P = 0.17)[14]. These observations highlight the potential value of establishing good practices early on in the career of an endoscopist.

HOW DO WE DETERMINE TRAINEE COMPETENCE?

Traditionally, credentialing guidelines have focused primarily on the number of colonoscopies performed to determine procedural competence. In a small study of 7 trainees (4 GI fellows, and 3 surgical residents), Freeman *et al*[15] defined competence based upon independent cecal intubation. They found that trainees were able to intubate the cecum without assistance only 80% of the time after the first 50 procedures and consequently concluded that > 100 cases were likely required to achieve a 90% success rate. Using a cecal intubation time of < 15 min, a cecal intubation rate > 90%, and a 6-point technical skill score as a measure of competence, Chak *et al*[16] found that trainees did not achieve an attending-level of proficiency in colonoscopy even after 120 procedures were performed. These observations form the basis for the Accreditation Council for Graduate Medical Education (ACGME) and ASGE recommendation that a trainee perform a minimum of 140 cases before competency can be assessed in colonoscopy[6,17]. The European Board of Gastroenterology, the Canadian Association of Gastroenterology and the Conjoint Committee for the Recognition of Training in Gastrointestinal Endoscopy in Australia however use the 100 case threshold[18-20]. In the United Kingdom, JAG guidelines recommend a higher threshold (200 independently completed colonoscopies)[9].

Recently, several studies have highlighted the fact that these numbers represent a minimal threshold for competence and that procedural numbers by themselves do not guarantee trainee proficiency. In a large study involving 15 tertiary care centers in South Korea, Lee *et al*[21] found that trainees were able to independently intubate the cecum > 90% of the time, and attain a cecal intubation time of < 20 min only after > 150 procedures were performed. Spier *et al*[22] defined competence as the point at which trainees were able to perform all aspects of colonoscopy (cecal intubation, polypectomy, hemostasis) without the aid of an attending > 90% of the time. Using this definition, the investigators found that all of the 11 GI fellows studied attained these objectives by 500 cases but none attained that goal by the 140 case threshold set by the ASGE/ACGME guidelines[22]. And in a multicenter study[23] of 7 first-year GI fellows at two separate training programs, our own group sought to determine the threshold number of cases at which trainees were able to achieve: (1) Independent cecal intubation rate of ≥ 90%; (2) Independent ADR of ≥ 25%; (3) Mean withdrawal time ≥ 6 min; and (4) Ability to successfully remove polyps without the aid of the attending ≥ 95% of the time. This study was unique in that nurses were asked to judge whether each of the skills (adenoma detection and removal, cecal intubation) were performed by the fellow without significant assistance by the attending. Consequently, trainees were given credit for adenoma detection only if the adenoma was determined to be independently detected and removed by the trainee in the opinion of the endoscopy nurse. Using these criteria, we found that trainees achieved all of the quality benchmarks only when 201-250 procedures were performed[23].

Recognizing the inherent shortcomings in assigning competence solely based upon procedural numbers, recent efforts have focused on developing evaluation systems that assess both the technical and cognitive skills necessary to perform colonoscopy. In the United Kingdom, the JAG group has developed the Direct Observation of Procedural Skills (DOPS) evaluation for colonoscopy as part of a national system of accreditation for GI trainees[24]. Using a 4 point scoring system ranging from 1-Accepted standards not yet met; frequent errors uncorrected to 4-highly skilled performance, assessors are tasked with grading trainees on both diagnostic and therapeutic skills in colonoscopy. In a study of 111 attending endoscopists, Barton *et al*[24] demonstrated that DOPS had good relative reliability (G = 0.81) and a good correlation with a questionnaire that assessed candidates' knowledge. While the value of DOPS as a method for determining trainee competence is yet to be validated, current JAG guidelines require a total of 10 DOPS evaluations with > 90% of them having no score less than 3 for any given skill. A similar scoring system known as the Direct Observation of Polypectomy Skills (DOPyS) has also been developed by JAG to determine competence in polyp removal using the same four point rating scale with scores of 1-2 considered as failing grades[25]. In a study by Gupta *et al*[25], DOPyS was found to have discriminatory value in differentiating experienced endoscopists with > 1000 procedures from GI trainees who had limited experience in therapeutic colonoscopy. The added advantage of the DOPyS rating system is that it has been validated to be applied towards video-recordings of procedures.

In the United States, Sedlack[26] have made significant strides in the development of a comprehensive evaluation system for determining trainee competence with the advent of the mayo colonoscopy skills assessment tool (MCSAT). Using a rating system of 1 (Novice) to 4 (Superior), the MCSAT evaluates trainees during live cases[26]. Trainees are assessed in terms of cognitive skills such as knowledge of indication for procedure, use of initial sedation, landmark localization, and pathology identification. They are also are evaluated on procedural abilities such as safe endoscope advancement techniques, loop reduction, mucosal visualization during withdrawal, and polypectomy. In a large study of 41 GI fellows who were evaluated during 4103 procedures, the investigators determined that a mean score of $\geqslant$ 3.5 in all MCSAT parameters along with a cecal intubation rate of 85% and a mean cecal intubation time of less than 16 min best distinguished experienced endoscopists from trainees who had not yet met minimal competence thresholds[27]. Furthermore, they found that GI fellows did not reach these goals until 275 procedures were performed[27]. Because of this work, the most recent ASGE Core Curriculum has endorsed using the MCSAT as a tool for competency assessment throughout colonoscopy training[7].

DO TRAINEES CURRENTLY ATTAIN COMPETENCE?

While there are no formal studies outlining the characteristics of colonoscopy training among Gastroenterology, Surgery and Family Practice programs, it is highly probable that a large degree of variability exists in the educational approaches taken towards teaching trainees how to perform the procedure. Teaching strategies likely vary with the "See one, do one, teach one" approach on one end of the educational spectrum and more didactic and hands-on instruction by an experienced endoscopist on the other. This heterogeneity in training is highlighted by studies that compare GI trainees and surgical residents in achieving benchmarks in quality colonoscopy. In a study of 7 GI fellows and 6 surgical residents, Leyden *et al*[28] found that surgical trainees had lower cecal intubation rates (84% *vs* 93%, $P < 0.0001$), polyp detection rates (14% *vs* 21%, $P < 0.0001$) and ADR (9% *vs* 14%, $P = 0.0065$). A similar study by Spier *et al*[29] found that surgical residents only had a cecal intubation rate of 47% after a mean of 80 procedures were performed.

Even among trainees in recognized GI fellowship programs, recent studies point to potential deficiencies in the approach towards teaching colonoscopy. In an innovative tandem colonoscopy among procedures performed by GI fellows, Munroe *et al*[30] found an overall adenoma miss rate of 27%. Furthermore, the investigators found that there was a 2.2 fold decrease in the risk of missing an adenoma with each 10 fold increase in trainee experience[30]. Thus, to attain a less than 25% adenoma miss rate, a trainee would have to perform 450 procedures, a number that many GI fellows and certainly most surgical and family practice trainees may never reach in the course of training. One potential explanation for this finding is a failure to fully incorporate quality guidelines into the educational curriculum on the part of many training programs[30]. In an online survey on quality guidelines for colonoscopy, GI fellows received a mean score of 55% correct, with only 42% identifying the correct cecal intubation rate goal and 44% indicating the correct ADR benchmark[31].

Finally, feedback from GI trainees themselves highlight the need for improvements in colonoscopy instruction. In a survey of 169 GI trainees in the United Kingdom, Wells *et al*[32] found that only 36% felt that they were "fully" trained in colonoscopy. Furthermore, the respondents estimated than an attending was in the room to provide supervision in only 30% of colonoscopies that were performed[32]. Trainees also cited important aspects of effective teaching which included: (1) Close interaction with a supervisor who has good teaching skills; (2) Systematic approach towards endoscopic techniques; (3) Excellent supervision and discussion-based training; (4) Attendance of a course on quality colonoscopy; and (5) Smaller procedure schedules to allow for training time[32]. These comments point to the need for reforming our current approach toward teaching colonoscopy.

HOW DO WE HELP TRAINEES ATTAIN COMPETENCE?

Advances in both technology and teaching methods clearly point the way towards a new curriculum that is based upon establishing competence in colonoscopy. From a technological standpoint, innovations in simulation present new avenues for trainees to develop and hone cognitive and technical skills away from the time pressures and risks of performing procedures on live patients. Current simulators consist of a mannequin and a modified colonoscope with pressure sensors which mimic the resistance felt with scope advancement and loop formation. Trainers are able to assign specific modules to trainees on the simulators ranging from basic lessons meant to establish hand-eye coordination skills to more realistic scenarios in which full cases are performed on simulated patients.

Several randomized controlled trials have demonstrated a potential benefit to the use of simulation during the early phase of colonoscopy training. Cohen *et al*[33] compared simulation (Simbionix GI Mentor, Simbionix Corporation, Cleveland, Ohio) *vs* non-simulation trained GI fellows in terms of competence measures on colonoscopies performed on live patients. In particular they looked at subjective (rating scale of 1-5 on the part of the trainer) and objective measures such as successful cecal intubation and the ability to correctly identify

Table 2 Median performance scores (25%-75% interquartile range) on live-patient procedures among fellows trained on colonoscopy simulator *vs* trainees with bedside training alone[34]

Fellow performance parameters	Simulator fellow (n = 462)	Traditional teaching (n = 423)	P value
Time to reach maximum insertion (min)	20.0 (14.0-25.0)	20.0 (15.0-29.8)	0.170
Median depth of unassisted insertion (1 = rectum, 6 = terminal ileum)	5.0 (4.0-6.0)	5.0 (4.0-5.0)	0.002
% of colonoscopies completed independently	64.1% (59.7-68.5)	56.3% (51.6-61.0)	0.018
Identifies landmarks (1 = strongly disagree, 7 = strongly agree)	7.0 (6.0-7.0)	6.0 (6.0-7.0)	0.003
Inserts in a safe manner (1 = strongly disagree, 7 = strongly agree)	7.0 (6.0-7.0)	7.0 (6.0-7.0)	0.020
Adequately visualizes mucosa during withdrawal	7.0 (6.0-7.0)	6.0 (6.0-7.0)	0.009
Responds appropriately to patient discomfort	7.0 (6.0-7.0)	6.0 (6.0-7.0)	0.255
Patient-reported discomfort	1.0 (1.0-4.0)	1.0 (1.0-4.0)	0.090

cecal landmarks[33]. During the first 80 live cases, the simulator-trained group had higher objective and subjective levels of competence[33]. However after 120 cases, the advantage found with simulation was no longer present and both groups still required a total of 160 live cases to attain 90% competence[33]. In a similar study by Sedlack *et al*[34], GI fellows who received training using the AccuTouch Colonoscopy Simulator (Immersion Medical, Gaithersburg, MD) scored better on all performance measures (Table 2) except for cecal intubation time when compared with trainees who received just bedside instruction on live patients. However, the differences between the two groups also dissipated once greater than 30 procedures were performed[34]. The positive impact of simulation during the early phases of colonoscopy instruction is well summarized in a meta-analysis by Walsh *et al*[35] who found that there was a significant benefit when simulator-based training was compared to no-training at the beginning of fellowship. In contrast, the advantage of simulator-based training was less pronounced when it was pitted against usual training on live patients[35].

Along with simulation, recent advances in technologies designed to be used during live-cases also hold promise in helping trainees to achieve competency in colonoscopy. During training, the formation and reduction of loops that occur with scope advancement represent one of the most important skills that a trainee must acquire in order to safely perform colonoscopy. To assist in this task, magnetic endoscope imaging (MEI) has been developed to provide trainees with a real-time view of scope positioning. With the ScopeGuide (Olympus Corporation, Tokyo, Japan) MEI system, coils embedded within the colonoscope generate an electromagnetic field which is detected by an external receiver dish producing a 3-dimensional image of the location of the colonoscope[36]. In a randomized controlled trial comparing MEI assisted *vs* standard colonoscopy Shah *et al*[37] found that trainees who performed with MEI had a shorter duration of loop formation (median 3 min *vs* 5.4 min, P = 0.0049) and a fewer number of loop straightening attempts (5 *vs* 12, P = 0.0002). In a similar study of trainees who had experience of fewer than 200 procedures, Holme *et al*[36] observed a higher rate of cecal intubation (77.8% *vs* 56%, P = 0.022) and a lower percentage of cases which required attending assistance (18.5% *vs* 40%, P = 0.018) in the MEI group. Thus, MEI may provide a useful role in colonoscopy training if it aids trainees in acquiring the feedback response for recognizing loop formation.

Water immersion colonoscopy also represents another more readily available modality which may assist trainees in their development of procedural competence. In the early stages of training, novices often have difficulty in discerning the direction of the lumen and as a result this leads to prolonged cecal intubation time, the excessive insufflation of air into the colon, looping of the colonoscope and patient discomfort. Addressing these issues, the water immersion technique refined by Leung *et al*[38] involves filling the colonic lumen with room temperature or warm water using a pump connected to the colonoscope. The air pump is turned off during the intubation phase and 30-60 cc of water is instead used to open the collapsed lumen[38]. In a randomized controlled trial by Leung *et al*[39], trainees who used water immersion had shorter cecal intubation times (13 min *vs* 20.5 min, P = 0.0001), lower mean doses of midazolam (mean dose 2.41 mg *vs* 2.9 mg, P = 0.001) and Fentanyl (mean dose 37.9 mcg *vs* 71.7 mcg, P = 0.002) than those who utilized standard air insufflation. More importantly, a recent meta-analysis found that water immersion resulted in higher ADR (RR = 1.16, 95%CI: 1.04-1.30, P = 0.007) and would lead to an additional 68000 colonoscopies in the United States where an adenoma is detected[40].

Along with water immersion, hood-assisted colonoscopy may also aid trainees in determining the direction of the lumen with scope insertion. Because novice endoscopists often have poor control of scope movement and directionality, a significant amount of time is spent with a "redded-out" image because the scope tip is stuck against the colonic wall[41]. This leads to prolonged scope insertion time and excessive air insufflation. A transparent hood that is attached to the instrument tip may help with this problem by maintaining a proper distance between the colonoscope camera and the colonic mucosa. Furthermore, the hood may assist in mucosal inspection and polyp detection upon withdrawal since it helps with depressing and exposing colonic folds. In a randomized trial of hood colonoscopy *vs* standard colonoscopy among Italian trainees, the hood group was found to have a shorter cecal intubation time (4.4 ± 1.8

vs 7.3 ± 3.5, $P < 0.01$), and a higher rate of detecting polyps 5 mm-1 cm in size (72% *vs* 44%, $P = 0.01$)[41]. A similar randomized controlled trial in Japan, found that trainees had a higher cecal intubation rate (60.7% *vs* 37.4%, $P = 0.003$) among female patients and a 17% reduction in cecal intubation time when hood-assisted colonoscopy was used[42]. Consequently, hood-assisted colonoscopy and water immersion both hold promise as future techniques in colonoscopy training if they assist trainees in the sustained acquisition of skills in luminal orientation, safe scope advancement and polyp detection.

While technology may prove to be important in shaping the future of colonoscopy instruction, the role of feedback will remain the central foundation of the colonoscopy core curriculum. The ASGE Training Committee guidelines recommend that: "Regardless of the method ultimately used, it is recommended that some form of continuous assessment be performed and the results used ideally in a formative manner- to give feedback to trainees in areas where further work may be needed-and a summative assessment of skills that can be used for competency assessment"[7].

Despite this directive, the utility of assessment and feedback as teaching tools in colonoscopy remains poorly understood. Koch *et al*[43] developed a self-assessment form (Rotterdam Assessment Form) which asked trainees to rate their own performance after completion of individual procedures. The form consisted of objective data including successful cecal intubation, cecal intubation time, and the amount of time spent without attending assistance along with a subjective rating of various colonoscopy skills using a visual analogue scale and an action plan for improvement[43]. After the implementation of this self-evaluation system, the cecal intubation rate improved from 65% after the first 20 procedures to 85% at 200 procedures ($P < 0.001$)[43]. Cecal intubation time also improved from 13 min, 10 s at 20 procedures to 8 min 30 s after completion of 200 colonoscopies[43]. However, even with these results, it remains largely unclear if the self-evaluation system resulted in an actual improvement on the normal rate of skills acquisition or improvements in polyp detection that one would see in the regular course of training.

While the clinical evidence for using feedback as a training tool in colonoscopy remains limited, this area provides fertile ground for future research endeavors. In a study by Rex *et al*[44] the act of video-recording individual colonoscopies resulted in a 49% improvement in mucosal inspection time and a 31% improvement in withdrawal technique among experienced endoscopists. Relying upon the concept of the Hawthorne effect whereby subjects improve or modify their behavior in response to the fact that they are being studied[45], it is certainly possible that video-recordings can be used to improve technical and cognitive performance among trainees. Furthermore, the addition of the MCSAT to the colonoscopy core curriculum also affords the opportunity to use continuous feedback of competency scores and comparisons with the group average to assist novices in identifying areas that require improvement. Finally, the current JAG certification process also requires trainees to provide a formal assessment of the trainers' performance during individual procedures. Similar "train the trainer" measures that seek to improve the quality of colonoscopy instruction are vitally important from both research and educational standpoints.

CONCLUSION

While the process of certifying competence has clearly evolved away from the apprenticeship model of medical training, the future shape of colonoscopy instruction remains to be determined. With the increasing emphasis on quality benchmarks and recent data questioning the pre-eminent role of colonoscopy in CRC screening due to variability in endoscopic practice, the task of evaluating and teaching competence remains as important as ever. The movement away from concentrating on procedural numbers and towards the attainment of milestones in the development of cognitive and technical skills represents a significant shift in determining competence in colonoscopy. As first steps in this evolution, the MCSAT and the DOPS evaluation systems standout as significant contributions to the process of re-defining the core curriculum. Whether the solution lies in better technology or a feedback-based system of procedural instruction, the approach towards educating trainees will need to adapt to a curriculum that rightfully emphasizes the importance of quality colonoscopy.

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