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Competency Based Medical Education in Gastrointestinal Motility

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Abstract

Traditional apprenticeship based medical education methods focusing on subjective evaluations and case-volume requirements do not reliably produce clinicians that provide high-quality care in unsupervised practice. Consequently, training approaches are shifting towards competency based medical education, which incorporates robust assessment methods and credible standards of physician proficiency. However, current gastroenterology and hepatology training in the US continues to utilize procedural volume and global impressions without standardized criteria as markers of competence. In particular, efforts to optimize competency based training in gastrointestinal (GI) motility are not underway, even though GI motility disorders account for nearly half of outpatient gastroenterology visits. These deficiencies compromise the quality of patient care. Thus, there is a great need and opportunity to shift our focus in GI motility training towards a competency based approach. First, we need to understand rates of learning for individual diagnostic tests. Next, integrated systems that standardize training and monitor physician competency for GI motility diagnostics are required. In addition, certification processes to credential competent physicians need to be developed. These advances are critical to optimizing the quality of GI motility diagnostics in practice.

Keywords

Competency based medical education; Gastrointestinal motility; Health care quality

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Overview of Competency Based Medical Education

First described in the 1950s, competency based training has transformed learning in a wide variety of professions including social work, teacher education, and pharmacology. The field of medicine, however, has been slower to adopt competency based education. (1) Instead, medical training has traditionally followed an apprenticeship model in which educators evaluate proficiency subjectively and through minimum time-spent or case-volume requirements. (1, 2) However, not all trainees learn at the same pace. Competency based on numbers without robust assessment methods and credible standards is insufficient to produce clinicians that provide high-quality care in unsupervised practice. (3) In this era of value-based medicine which emphasizes quality measurement and provider proficiency, traditional training methods are critically deficient.

Acknowledging the current limitations in competency assessment, the Accreditation Council for Graduate Medical Education (ACGME) issued the Next Accreditation System in 2014 to ensure a focus on trainee competence. (4) As a result, outcome-based milestones within six core competencies are evaluated and a new entity the Clinical Competency Committee, formally reviews trainee proficiency. (4) Similarly, the International Competency-Based Medical Education collaborators endorse shifting our training approach to 1) Focus on outcomes to ensure that every practitioner is prepared for unsupervised practice, 2) Reorganize curricula around competencies or abilities, 3) Shift from time-based training to focusing on the learner's ability, and accommodate different rates of learning and skills attainment, and 4) Promote learner centeredness. (1)

Competency Based Medical Education in Gastroenterology & Hepatology Training

Gastroenterology/hepatology is a unique, complex and diverse field, which requires consultants to be competent in a wide array of clinical knowledge and technical skills. However, processes in the US to ensure gastroenterologist competency in unsupervised practice are not structured or well defined. The current recommendations set forth in the gastroenterology training core curriculum, formulated by the ACGME and four professional societies (American Association for the Study of Liver Diseases, American College of Gastroenterology, American Gastroenterological Association, and the American Society for Gastrointestinal Endoscopy) state that fellows must be competent in all medical, diagnostic, and surgical procedures considered essential for the area of practice. Procedures must be directly supervised until proficiency has been acquired and documented. (4, 5) Surveys of gastroenterology training programs across the US find that the majority continues to determine competency based on procedural volume and global impressions of competence without standardized criteria. (2) Although increasingly available, few programs utilize endoscopy skill assessment tools or formal online training modules or programs. (2) Thus, current practice lacks objective benchmarks and predominantly relies on supervisor subjectivity. Moreover, it enables poor practice patterns to perpetuate from educator to disciple and so forth. Clearly, our system does not sufficiently incorporate competency based

medical education (CBME), and fails to ensure that gastroenterologists attain the technical, cognitive and integrative skills required for safe and effective unsupervised practice.

Competency Based Medical Education in Endoscopy

Recognizing deficiencies in current gastroenterology training, investigators have recently focused upon understanding learning curves in endoscopic training and skills. Work in advanced endoscopic training has uncovered significant variability in trainee learning curves, reiterating that a specific case volume does not ensure competence in both endoscopic ultrasound and endoscopic retrograde cholangiopancreatography. (6, 7) Similarly, the number of colonoscopies performed does not predict quality outcomes. (8) These studies conclude that future work should focus on standardizing trainee performance and defining competence in endoscopy.

Investigators and educators are also working towards incorporating technology into gastroenterology training. Many studies demonstrate the utility of simulator training and skills assessment tools for competency in colonoscopy. (8–10) Additionally, the use of audiovisual training modules combined with active feedback has enhanced characterization of diminutive polyp histology with narrow band imaging. (11) However, further work is needed to understand the precise role of technology in endoscopic training and ensuring competency.

Competency Based Medical Education in Gastrointestinal Motility

Diagnostics

Endoscopic training has taken precedence over other vital aspects of gastroenterology training; in particular less time in training is devoted to gastrointestinal (GI) motility and diagnostics. (12) Although GI motility disorders account for 50% of outpatient gastroenterology visits, most gastroenterologists are not trained to diagnose or treat these disorders. A survey of 171 training programs conducted by Dr. Satish Rao reported that only 25% of programs offer some type of training in GI motility, with only 12% offering comprehensive upper and lower GI motility training. (12) Recognizing this unmet need, the US core curriculum recommends two levels of GI motility training. In Level 1 trainees should have outpatient clinical experience with motility disorders and familiarize themselves with indications and interpretation of diagnostics; this is considered basic training and expected of all gastroenterology fellows. Physicians specializing in motility and functional disorders are recommended to fulfill Level 2 requirements in order to gain proficiency in diagnostics and therapeutics of GI motility disorders [Table 1]. However, training recommendations are based on expert opinion and generally rely on case-volume and time requirements rather than achieving milestones. Recognizing the need for higher quality training in GI motility, the American Neurogastroenterology and Motility Society offers a one-month robust apprenticeship-based training program to select trainees at one of ten centers of excellence across the US. (12, 13) In addition, some institutions offer a one-year advanced GI motility training program. (5, 12) Despite the advent of one-month apprenticeships and year-long fellowships, these efforts cannot meet the training needs of the thousands of trainees and gastroenterologists in practice.

Furthermore, as there is no agreed upon way to “certify” competency in motility, in practice any board-certified gastroenterologist may choose to independently interpret diagnostic studies without completing skill-specific training requirements. In fact, only a minority of questions in the Gastroenterology Certification Examination focuses on GI motility diagnostics; thus, board certification does not ensure competency in the management of patients with GI motility disorders.

It is not surprising that marked variation in practice quality exists across the nation; additional methods to standardize training and measure competency in GI motility are critically needed. There are, however, several impediments to this process. For one, we have insufficiently examined learning curves and competence for specific diagnostic tests. (14) As such, we do not understand what is required of standardized training programs. Additionally, it is unlikely that individual training programs can dedicate additional time and resources to develop novel methods of training for their trainees, particularly in face of the already increased requirements. (12) Moreover, we have not defined who is responsible for ensuring and mandating the high-quality interpretation of GI motility diagnostics.

Unlike endoscopy, GI motility diagnostics are interpreted through a computer-based software. This offers the potential to monitor physician competency through remote web-based systems. In addition, the diagnostic approaches are largely visual and algorithmic, providing the opportunity to create robust audio-visual training modules. Understanding the limitations of our current framework and the unique aspects of motility diagnostics, we need to incorporate CBME into the training process for GI motility diagnostics such as reflux monitoring, anorectal manometry, esophageal manometry, motility capsule monitoring, and breath testing. In a recent pilot study evaluating the impact of a web-based training system on learning curves of twenty gastroenterology trainees naïve to high-resolution esophageal manometry, we identified significant variability in learning curves across trainees, emphasizing that case-volumes cannot ensure competency. We were able to monitor learning curves over time, and reported that a majority of trainees achieved competency through web-based training and active feedback. Importantly, we also identified trainees with slower rates of learning who would require more intensive education and supervision to achieve competency. (15) This important work highlights the need to, first, understand learning curves for GI motility diagnostics. Next, utilizing this data, we should create a web-based system incorporating standardized training with competency measurement.

While developing novel training systems should undoubtedly be led by physician experts and medical educators, it is unclear who will ultimately “certify” competency in complex diagnostics such as motility testing. Is it the responsibility of the individual institutions, professional societies, certification systems, or diagnostic manufacturers? Examples of injuries and deaths related to the introduction of robotic surgery emphasize that manufacturers cannot fulfill the role of physician training and credentialing. In these cases, the medicolegal responsibility for ensuring competency is ultimately the role of the institution. (16) In an interview with the manufacturer, Sandhill Scientific, representatives echoed that industry is not responsible for ensuring interpreter competency. While Sandhill Scientific provides didactic learning and hands-on platforms for physicians and technicians, this training is not mandated. Considering these perspectives, the development a certification

process for the interpretation of GI motility diagnostics may require collaborative efforts of professional societies and national certification systems.

Final Thoughts

While a major undertaking, it is time to address the gap in CBME in gastroenterology. Having an interest in GI motility does not equate to being an expert, and yet this is often how experts are designated in practice. It is the medical community's ethical and professional responsibility to produce high quality physicians. We need to increase the awareness of existing training deficiencies and trajectories of medical training; soon CBME will be required of all training programs and across all disciplines. Multidisciplinary collaborations with medical educators, computer programmers, analysts, professional societies and certification agencies are needed to create and mandate robust training and competency assessment processes. In particular, the field of GI motility has been overshadowed and yet its computer-based design offers the opportunity for integrated training and assessment systems. In the era of CBME, we should focus on enhancing the quality of GI motility diagnostics in practice.

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Abbreviations

GI	Gastrointestinal
ACGME	Accreditation Council for Graduate Medical Education
CBME	Competency based medical education

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Key Messages

Competency based medical education is an outcomes-based approach to evaluate medical training using an organized framework of competencies. Competency based medical education shifts the training focus from subjective evaluations and case-volume requirements to objective assessments of learner skills and abilities, in order to optimize the quality of health care delivery. This paper discusses the current state of training in gastroenterology. In particular, it highlights the lack of competency based training in gastrointestinal motility diagnostics and reviews the work needed in order to move towards a competency based approach in gastrointestinal motility.

Table 1

Procedure Type and Minimum Number of Studies Recommended to Achieve Proficiency. (5)

Procedure	Number of studies recommended
Esophageal manometry ^a	50
Esophageal pH metry ^a	25
Gastroduodenal manometry ^a	25
Gastric emptying scintigraphy ^a	25
Anorectal manometry ^a	30
Biofeedback therapy ^a	10
Wireless motility capsule test ^b	50
Impedance esophageal pressure topography ^b	50
Impedance pH metry ^b	50
Esophageal balloon distension test ^b	25
Glucose breath test ^b	25
Fructose breath test ^b	25
Lactose breath test ^b	25
Colonic transit test ^b	25
Gastric electrical stimulation for gastroparesis and sacral nerve stimulation for fecal incontinence ^b	10

^aRecommendation of the GI Core Curriculum to Achieve Expertise in Motility.^bAdditional tests believed to be important for proficiency as level 2 GI trainees (not endorsed by GI core curriculum). (12) Trainees should also spend 3 months in a GI motility laboratory under the preceptorship of experienced clinicians in the performance of these studies.