Teaching and Assessing Colorectal Surgery Residents in the Age of ACGME Competencies: Pieces of the Whole

Jan Rakinic, M.D.¹

¹ Department of Surgery, Southern Illinois University School of Medicine, Springfield, Illinois.

Clin Colon Rectal Surg 2012;25:143–150.

Address for correspondence and reprint requests Jan Rakinic, M.D., Department of Surgery, Southern Illinois University School of Medicine, P.O. Box 19638, Springfield, IL 62794-9638 (e-mail: jrakinic@siumed.edu).

Abstract

Keywords

- ACGME competencies
- colon and rectal surgery residency
- technical competence
- surgical judgment
- effects of duty hour limits

Educators have struggled with teaching and evaluation of the six Accreditation Council for Graduate Medical Education (ACGME) core competencies since their introduction in 1999. In addition, many authors have questioned the construct validity of the competencies. Concern has also arisen regarding the educational effects of the competencies and the subsequent limitation of resident duty hours, the combination of which have forced unprecedented changes in American graduate medical education. This article attempts to present an understanding of how these events have had direct and indirect effects on the education of residents in colon and rectal surgery, and to provide a framework for educators in colon and rectal surgery to adapt in their curricula.

Objectives: On completion of this article, the reader should be able to (1) summarize the major changes in American graduate medical education in the last 12 years, and (2) discuss some of the educational tools and strategies that can be used in colon and rectal surgery residency training.

Introduction of the Six Competencies: Aims of the Outcome Project

In 1999, the Accreditation Council for Graduate Medical Education (ACGME) began the Outcome Project, intended to enhance residency education and accreditation effectiveness by increasing emphasis on educational outcomes.¹ ACGME research staff selected 84 competencies that were rank-ordered by all Residency Review Committee (RRC) members, as well as focus groups of residents, program directors, and public representatives. An advisory committee reviewed the vetting process and then recommended the six core competencies, also adopted by the American Board of Medical Specialties (ABMS); ► **Table 1**: patient care, medical knowledge, practice-based learning and improvement, systems-based practice, interpersonal/communication, and professionalism. These six competencies now form the basis of American graduate medical education. The project's aim is

for residents to progress from merely knowing how to model behaviors associated with each competency, to “showing how” to perform, to actual performance—displaying in practice the behaviors associated with each defined competency.² Planned progression of the Outcome Project includes full integration of the competencies into residency curricula as evidenced by robust learning opportunities and assessment, use of performance data to assess residency program effectiveness and identify needed improvements, and linkage of education and patient care quality using external measures such as patient care process and outcome indicators and patient questionnaires. The anticipated algorithm is that residency programs which produce competent physicians will also deliver improved patient care, each of these outcomes will be measurable, and causation will be demonstrable.¹ Swing acknowledges the challenge of this, stating “Assessment and analyses will be required to establish that patient care is better in residency programs that have effective education in the competencies....and obtaining evidence that links competency-related educational activities, improvement in resident performance and better patient care will be challenging.”¹

Graduate medical education (GME) residency training programs and program directors (PDs) were directed to begin

Table 1 Accreditation Council for Graduate Medical Education (ACGME) Competencies

Patient care	Residents must be able to provide patient care that is compassionate, appropriate, and effective for the treatment of health problems and the promotion of health
Medical knowledge	Residents must demonstrate knowledge about established and evolving biomedical, clinical, and cognate (e.g., epidemiological and sociobehavioral) sciences and the application of this knowledge to patient care
Practice-based learning and improvement	Residents must be able to investigate and evaluate their patient care practices, appraise and assimilate scientific evidence, and improve their patient care practices
Interpersonal and communication skills	Residents must be able to demonstrate interpersonal and communication skills that result in effective information exchange and teaming with patients, patients' families, and professional associates
Professionalism	Residents must demonstrate a commitment to carrying out professional responsibilities, adherence to ethical principles, and sensitivity to a diverse patient population
Systems-based practice	Residents must demonstrate an awareness of and responsiveness to the larger context and system of health care and the ability to call on system resources to provide care that is of optimal value

teaching and assessing trainees in the ACGME six core competencies. The ACGME provided a generic set of assessment tools as a resource for PDs (► **Table 2**).³ The ACGME had the expectation that evaluation tools would be adapted for specialty-specific use by PDs and faculty. This has proven more challenging than expected. Initial barriers included a paucity of education for PDs and faculty members on definition of the competencies, insufficient training for PDs and faculty in how to teach the competencies, an absence of validated tools for assessment of trainees' achievements, and a general lack of resources at the program level.

The three evaluation methods most often used in GME are familiar to all: direct observation, global assessment, and in-training exam.⁴ Direct observation, not included in the ACGME toolbox due to its subjective nature, is used by over 90% of GME programs; it is relied on most heavily for evaluation of interpersonal/communication skills and patient care (over 90% for each) and least for practice-based learning and improvement (47%). Global assessments are utilized in 81% of programs, almost equally for all competencies (range

58–68%). In-training exams are used by 75% of programs, chiefly for medical knowledge. Different tools may assess the same competency in divergent ways, with little correlation;⁵ some authors believe current assessment tools cannot assess the competencies independently of one another.⁶ Green and Holmboe⁷ contend that the biggest problem in evaluating the competencies is “not the lack of adequate assessment instruments but, rather, the inconsistent use and interpretation of those available by unskilled faculty.” It is clear that no one tool is ideal for assessment of all six defined competencies; some tools may be better suited for evaluation of certain competencies, but implementation may be limited due to financial and other resource restrictions, as with objective structured clinical examinations (OSCEs), simulation, and standardized patients, each utilized in 15% of residency training programs at most.⁴

Program directors in a wide range of specialties have independently reported several barriers to compliance with the Outreach Project: education inadequacies regarding definition, teaching, and evaluating the competencies; insufficient personnel and nonpersonnel resources; and lack of financial support and protected time for PD duties are the most commonly cited. PDs of several GME programs at one midwestern medical school agreed that they understood the competencies, but were not well prepared to meet the teaching and evaluation requirements, citing inadequacies in PD time, support staff size, curriculum development and evaluation, and funding for nonpersonnel resources.⁸ Urology PDs had concerns regarding inadequate staffing, insufficient financial support, and inadequate validated instruments for evaluation.⁹ Family medicine PDs identified inadequate PD time and lack of faculty development as primary barriers to competency evaluation.¹⁰ Ophthalmology PDs reported receiving inadequate resources, including education on the competencies and funding.¹¹

A 2010 survey of PDs in colon and rectal surgery identified similar challenges in teaching and evaluation of the six competencies. Although most respondents felt able to optimize educational opportunities in the operating room, clinic, rounds, and journal club settings, two thirds identified a need

Table 2 Accreditation Council for Graduate Medical Education (ACGME) Assessment Toolbox³

1. 360 evaluation
2. Chart stimulated recall
3. Checklist evaluations
4. Global assessments
5. Objective structured clinical examinations (OSCEs)
6. Procedure or operative logs
7. Patient surveys
8. Portfolios
9. Record reviews
10. Simulations and models
11. Standardized oral examinations
12. Standardized patient examinations
13. Written examinations

for additional education in competency-based teaching and evaluation for themselves and their faculty. Individuals commented on the need for validated assessment tools for both resident and faculty use. Fully two-thirds of respondents reported receiving no protected time or financial support for their PD responsibilities. Frequent themes in narrative comments included recognition that these concerns are shared across residency programs and specialties, and concern that educational resources provided by the ACGME were proving difficult to adapt for practical use.¹²

An additional hurdle for teaching and evaluating the six competencies is the tendency for physicians to appraise competency as chiefly cognitive or attitudinal. Silber's elegant study of global rating forms is concordant with earlier research indicating that physician evaluators view competence broadly in two dimensions, described by the authors as "interpersonal communication skills and professionalism" and "medical knowledge, patient care, and systems-based care."¹³ No differences were seen with respect to resident or evaluator specialty, or resident gender or level of training. Silber is among several authors who have questioned whether the six competencies represent valid measurement constructs.^{6,13-16}

Duty Hour Limits: Evolving Effects

In 2003, the American GME community was given another new parameter to manage: Standard duty hour restrictions were adopted by the ACGME. All residents were now limited to 80 duty hours per week averaged over 4 weeks, with a minimum of 8 hours free between shifts. Call duty was allowed to extend 6 hours beyond a 24-hour period to facilitate patient handovers and also for didactic experiences. One 24-hour period free of duties was required per week, and one 48-hour period (equivalent to a weekend) free of duties per month. The intent was to reduce medical errors attributable to resident fatigue. There was a disproportionate impact: Residents in some specialties and subspecialties had not exceeded 80 duty hours per week before adoption of the new limits, programs could be differentially affected by duty hour limits related to specialty and program size,¹⁷ and the intensity of a 16-hour duty period can vary significantly between specialties.^{18,19} Specialties in which residents had traditionally spent more than 80 hours per week in patient care and other learning activities experienced an immediate decrease in overall residency training time of up to 30%. Several other unanticipated effects of resident duty hour limits have been identified, among them the need for other individuals to perform duties once performed by residents, on-call residents being responsible for a greater number of inpatients, and increased costs to training programs. It has been assumed that training programs will continue to produce competent, well-trained physicians in the framework of the current duty hour restrictions without lengthening the training period; however, there has been no acknowledgment of or adjustment by the ACGME or the ABMS regarding the above observations.

Patient safety has not improved after adoption of duty hour limits, and reports of worsened patient outcomes are

appearing. An observational study of patients in Veterans Administration (VA) hospitals considered more "teaching-intensive" showed an improvement in mortality for four major medical diagnosis-related groups (DRGs; acute myocardial infarction, congestive heart failure, gastrointestinal bleed, stroke) comparing statistics from postduty hour limit years to years preceding the limits. No improvement was identified for surgical patients in the same hospitals and time period.²⁰ The same authors evaluated the much larger Medicare population for the same period and found no difference in mortality when all patients were considered,²¹ or when high-risk surgical populations alone were evaluated,²² nor any difference in patient safety indicators²³ or hospital readmissions.²⁴ A prospective cohort study involving residents from three large pediatric residencies found no difference in resident medication errors after duty hour limits were adopted.²⁵ On the other hand, several studies have reported increased rates of preventable complications after adoption of duty hour limits.^{26,27} Suggested reasons for the lack of demonstrable improvement include a significant increase in care transfer occurrences, increased intensity of duty shifts, and inattention to the role of resident supervision, none of which were considered as potential concerns at the time duty hour limits were imposed, yet any of which may outweigh resident fatigue as sources of error in patient care.¹⁸ Intensive attention is now being directed to how care transfer occurrences are conducted, as preventable adverse events are more than twice as likely to occur during periods of cross-coverage.²⁸ Residents and faculty alike believe that duty hour limits have negatively impacted continuity of care^{17,29-31}; this is unsurprising given the sharp increase in care transfer occurrences. Jamal et al³⁰ suggest that continuity of care should be a major focus of future investigation, as this contributes in a significant way to patient safety, especially in the fast-paced surgical environment. A complete and thoughtful review by Curet³² notes that many studies of work hour restrictions on patient care outcomes in medicine patients demonstrate a positive impact, but most studies in surgical patients show a decreased quality of patient care, and raises the possibility that surgical patient outcomes are dependent on factors other than rested residents.

Anticipated effects of duty hour restrictions included improvements in resident quality of life and improved resident performance on in-service and certifying examinations. Nearly all reports evaluating resident quality of life agree that improvement in this parameter has been significant.^{30,33-36} However, several unanticipated outcomes have been observed. Residents report that although duty hours are lessened, the intensity of the work is heightened, and cross-coverage loads have increased.³⁴⁻³⁷ Findings from a study including three large pediatric training programs revealed that total hours of resident work or sleep did not change after duty hour limits, nor did rates of resident motor vehicle crashes, occupational exposures, or depression.²⁵ Total compliance with the more restrictive duty hour limits increased resident sleep from 7.6 to 7.8 hours per 24-hour period on average in another large pediatrics program, but participation in bedside rounds and formal didactic conferences decreased,

and residents reported that work intensity was increased.³⁷ Neurosurgery program directors and chief residents surveyed in 2005 had concerns that duty hour limits would have negative effects on continuity of patient care, but most residents thought the restrictions were likely to result in improved American Board of Neurological Surgery (ABNS) written test scores, and would improve residents' research/publication-related activities.²⁹ Four years later, this optimism was shown to be premature: While USMLE scores for 2000–2008 entering neurosurgery residents were unchanged, resident scores on the ABNS exam between 2002–2007 decreased 16% ($p < 0.05$) and the number of resident-presented abstracts at the American Association of Neurological Surgeons annual scientific meeting fell by 7% ($p < 0.05$) between 2002 to 2007.³⁸ The authors of that study found that duty hour compliance in their own program produced a notable increase of resident on-call duty hours with significantly less time spent in educational conferences and the operating room.³⁸ Findings regarding general surgery high-stakes exams are mixed: Studies have reported that ABSITE scores increased slightly,^{31,39} substantially,⁴⁰ or not at all⁴¹ after adoption of duty hour limits; similarly, the first-time pass rate on the American Board of Surgery qualifying examination has been reported to increase,⁴² or remain unchanged⁴¹ after duty hour limits.

A recent review of operative cases reported by general surgery (GS) residents 2003–2008 showed that all academic years except 2003–04 had lower average operative volumes in the chief year and in total major procedures than the pre-duty hour limits academic year 2002–03.⁴³ Evaluation of 2006–2008 case logs of PGY-5 GS residents in one GS program, which is also a Level I trauma center, showed senior residents lost operative experience as a result of night float rotations, which are used in many programs to meet duty hour limits.⁴⁴ Curet cites a worrisome trend in decreased first-assistant cases done by interns and teaching cases done by senior and chief residents, speculating that this might represent a lengthening of the technical learning curve.³² Consider the often cited 10,000 hours of practice and 10 years as the time needed to achieve technical expertise: Purcell-Jackson published an analysis calculating that a typical GS resident working 80 hours per week will have ~19,200 hours of direct patient contact over a 5-year residency. Of this, ~20% is spent in the operating room—far short of the 10,000 hours of deliberate practice of focused activities with direct feedback, which is considered critical by educational psychologists to the development of expertise or performance of a technical skill.¹⁹ However, it seems unlikely that residents would currently be willing to accept an additional year (or years) of training to compensate for loss of clinical exposure due to duty hour limits.⁴⁵ A discussion of potential sources of funding if additional years of resident training are to be considered remains beyond the scope of this article.

As a result of resident duty hour limits, faculty workloads have increased and/or changed. One review of the impact of duty hour limits on surgical residents and faculty found that effects on resident lifestyle and education were positive or neutral, but faculty reported increased work hours and less

job satisfaction.³⁰ A survey of family medicine faculty found that many perceived an increase in their work related to duty hour limits, with 20% of respondents considering leaving academic medicine. Additionally, respondents did not find resident performance or patient care improved as a result of duty hour limits.⁴⁶ Increased faculty workloads experienced by academic anesthesiologists after adoption of duty hour limits required funding of additional providers to manage tasks previously performed by residents. No effect on patient safety or resident education was noted.⁴⁷ Total compliance with the more-restrictive duty hour limits in a large pediatrics residency caused redistribution of work during busy periods, which altered roles of attendings as well as senior residents. This may have had a deleterious effect on senior residents' ability to develop skills as supervisors and educators.³⁷ Program directors of several specialties in one academic institution suggested that programs could be differentially affected by duty hour limits related to specialty and program size. Most believed the duty hour limits would decrease resident's continuity with hospitalized patients, would not decrease resident fatigue, and would diminish residents' ability to develop competence in all of the six competencies except systems-based practice.¹⁷

Competency-Based Colorectal Surgery Residency Training: Teaching and Assessing

The challenges that must currently be faced when training residents in colon and rectal surgery are significant. A compulsory educational paradigm of six competencies has been adopted, despite concerns voiced by several thoughtful educators as to whether these competencies represent valid educational constructs. GME programs are facing level or decreasing funding despite mounting requirements and increasing program and personnel costs. Program directors are expected to devise new or adapt existing teaching methods and evaluation tools at the same time these six competencies are being taught and evaluated. Faculty is experiencing alterations in their work patterns and increased workloads, often with decreased professional satisfaction as a result. Residents enter colon and rectal surgery (CRS) programs having spent up to 30% less time in training than previously, and “ripple effects” on junior residents have just begun to be recognized. Resident professional activity has been reframed as “working shifts,” with periods of increasingly higher work intensity. Educational outcomes related to the GME changes of the past 12 years remain uncertain. New challenges to patient safety loom, including loss of continuity of care and an explosion in “transfer of care” occurrences, which are a direct consequence of duty hour limits imposed with no consideration of these predictable effects.

CRS training is unique among ACGME-accredited programs in that the program consists of one year, the trainee is required to have completed an ACGME-accredited residency in general surgery and attained eligibility for the ABS qualifying exam, and successful completion of the CRS training program confers eligibility to enter the certification process of the ABCRS. Because CRS residency leads to

independent board certification in colon and rectal surgery, the ACGME requires residencies and program directors in colon and rectal surgery to meet the same requirements regarding the competencies as do core residencies, which span a training period of 3 to 6 years. In 2011, PDs in CRS programs can reasonably expect that CRS trainees will have had 5 years of competency-based education and assessment, and be proficient in competency-based self-assessment and reflection. Of course, ongoing teaching and evaluation of the competencies is expected—but CRS trainees do not start at the “zero” level described for core residencies.

The ACGME Milestones Project is getting under way: The aim is to define concrete phases of ability in each competency that will identify each resident’s level of capability. Each task or process is broken down into five subunits or stages, and the trainee is graded according to his or her progress through the stages, from beginner to expert. As the project is still being crafted, the details regarding the number of five-step processes each competency will be broken down into, or how, has yet to be made known. It seems intuitive that the CRS trainee will enter many, if not all, of the milestones crafted for colon and rectal surgery around the Step 3 level, with previous training experiences fulfilling completion of the beginner stages. Using the same logic, actively teaching and assessing the CRS resident in the six competencies must acknowledge and build on the accomplishments already attained. Just as instruction and responsibility in the clinic and operating room build on the considerable skills acquired in general surgery residency, instruction and evaluation of the CRS resident in the six competencies has as its foundation the 5 years of competency education already amassed.

There has been a wide array of responses to the challenge of competency-based teaching and assessment. The medical education literature is replete with reports of newly constructed educational experiences, conferences, and rotations, most often designed to teach residents the competencies of systems-based practice and practice-based learning and improvement, which are the competencies most often overlooked in evaluators’ tendencies to focus on the cognitive/technical-attitudinal axis.¹³ For example, a required dedicated general competencies rotation was devised for a radiology residency, enfolding QI/QA projects with clinical float coverage.⁴⁸ A family medicine program includes a year-long program in which third-year residents develop a clinical practice guideline for management of a chosen disease, working with nurses and allied health personnel.⁴⁹ Small groups of residents in one general surgery program are assigned a perioperative care parameter and tasked with performance of a literature review and formulation of a standardized management algorithm based on level of evidence and available recommendations, with findings presented at a multidisciplinary grand rounds.⁵⁰

Considering the relatively compressed time CRS program directors have for the subspecialty surgical training of residents in colon and rectal surgery, as well as the generalized paucity of GME resources, the prospect of devising entirely new educational experiences is sobering, to say the least. However, my interpretation of the ACGME’s expectation that

“programs and PDs will adapt current tools for specialty use” starts with thoughtful examination of the present curriculum in colon and rectal surgery residencies. Such scrutiny will identify current teaching and learning activities that are underutilized with respect to competency education. Many, if not most, of the learning activities in a CRS residency enfold more than one competency, and with careful evaluation and documentation, current activities can be utilized to their fullest extent without the need for novel curricular introduction. The activity ripest for expansion is the morbidity and mortality conference. Presentation of complicated clinical cases with discussion of identified errors, literature review including level of evidence, and plans for modification in management of similar cases is clearly an activity that includes problem-based learning and improvement, patient care, and medical knowledge. When issues of professionalism, ethics, communication (including patient, family, other health care professionals), or systems problems arise and are treated in the same way, interpersonal/communication, professionalism, and systems-based practice competencies are being actively taught, often to learners at several levels as well as other health care professionals. GME programs in several specialties are currently using the morbidity and mortality conference in this way to teach the six competencies.^{51–53} However, discussion alone is not sufficient: A record of identified learning points and planned action(s) should be made, and kept for review by the resident and a faculty adviser or the PD; the document should become a part of the resident’s portfolio.⁵²

Other patient care-focused conferences can be used to teach competencies in addition to patient care and medical knowledge. A general surgery morning report conference evolved from a pure “sign-out” function into a patient-centered teaching conference that included review of relevant imaging, pertinent literature, and attending surgeon involvement. Residents felt the conference taught aspects of patient care and medical knowledge (100% each), practice-based learning and improvement (92%), interpersonal skills and communication (76%), and professionalism (60%), and ranked it as their most educational conference.⁵⁴ The conference also served as a supportive environment for residents to accrue teaching and leadership skills.⁵⁵ Again, keeping a record of the learning activity with appropriate review is important for reinforcement of lessons learned.

While recognizing the value of the common competencies, it is clear that the central role of colon and rectal surgery training lies in successfully imparting expert technical and judgment skills to the resident. Considering the importance of technical expertise in surgical specialties, a “seventh competency” of technical skills was proposed to the ACGME. As Swing recognized that competencies included “general competencies, specialty-specific knowledge, and skills,”² there was thought that a technical skills competency might be included; however, the ACGME declined, and technical proficiency was relegated to “add-on” status in the patient care competency.

Due to changes in graduate medical education and a logarithmic increase in the amount of knowledge, judgment,

and experience that resident surgeons must learn to practice safely and capably, the American Board of Colon and Rectal Surgery empowered a Blue Ribbon Panel in 2006 to consider new pathways that might lead to certification in colon and rectal surgery. The overarching goal was to keep colon and rectal surgery training comprehensive and valuable to assure the public that diplomates in colon and rectal surgery were indeed experts in the field. Recognizing the limited amount of instruction time inherent in the current CRS training schema, teaching and assessment of technical skills occupied a large part of the agenda. Checklists, while straightforward and widely used, are best applied to fundamental skills; checklists tend to reward thoroughness as opposed to expertise or competence. Global assessments, which remain one of the most widely used evaluation tools, possess limited validity and reliability due in part to (1) the tendency to aggregate performance across time, which does not allow for improvement to be identified; (2) the halo effect, in which a recent good or poor encounter colors the evaluator's recall of the entire period being assessed; and (3) range restriction, in which evaluators habitually do not use the entire range of responses available. As a result, global assessments are difficult to use in directing improvement unless used after single encounters, which increases the reliability.² Surgical skills laboratories, significantly beneficial in the PGY-1 and 2 years, produce little incremental improvement later in training and probably have limited application in CRS training. (The broad area of simulation in surgical education is addressed elsewhere in this issue by Drs. Sandra L. de Montbrun and Helen Macrae.) Discussion of clinical assessment and management evaluations and standard operative performance ratings in CRS training generated much interest. Educators recognize that structured examinations such as OSCEs and standardized patients remove the effects of daily environmental factors, and in so doing gauge what the resident can do in a situation less complex than reality. That said, these types of standardized assessments provide valuable information regarding the abilities of junior residents and medical students. For advanced learners such as CRS residents, however, performance assessment in real-life situations is superior for determining the level of clinical ability.² Huddle¹⁴ expands further on this: "Clinical judgment in context is our quarry.... Clinical competence can be fully assessed only in actual clinical contexts by those who already possess it. Such assessment will be irreducibly subjective and perspectival.... Assessment must thus be subjective for validity, but this requirement need not sacrifice reliability." Williams et al from Southern Illinois University have shown that sufficiently extensive sampling increases reliability of direct observation assessment.⁵⁶

Fostered by efforts of members of the Blue Ribbon Panel, the Operative Competency Evaluation Committee of the American Society of Colon and Rectal Surgeons has produced Operative Competency Forms, which are now available on the APDCRS website.⁵⁷ Six assessment tools have been produced to date: laparoscopic right colectomy, laparoscopic sigmoid colectomy, low anterior resection, abdominal colectomy/ileostomy/Hartmann closure of rectum, endoscopic skills, and fistula management. These tools evaluate detailed steps

of each operative procedure, with well-defined anchored rating criteria, and assessment of specific tasks rather than an amalgam of performance—all of which increase the reliability of the tool. The current intent is that these assessment forms be used in formative feedback and discussed with the CRS resident after completion to allow for reflection and performance improvement. Just as clinical teaching most frequently takes place as single encounters—the clinic visit, the operative procedure—rather than once weekly or monthly, so should assessment occur, ideally, after each such encounter; this increases the reliability of the assessment tool, allows for progress to be monitored, and provides meaningful feedback to the resident.

Present and Future: Is Competency Training Enough?

The Outcomes Project of the ACGME represents a major shift in the way graduate medical trainees are taught and evaluated, with the assessment process emphasized as its own outcome. The expectation is that competency-related educational activities will translate into improved resident performance and better patient care; this is not at all certain, and ACGME personnel themselves have pointed out the challenges.¹ Questions have also been raised as to whether competency-based education will be sufficient to train tomorrow's physicians to practice competent medicine in the real world. Lurie¹⁵ comments that the competencies "represent a statement of shared overarching values, aspirations for curricular reform. Competencies may be created by negotiation and consensus, but social consensus alone cannot compel them to materialize in actual testing outcomes." Some aspects of professional practice are amenable to the competency-based reductive approach—history taking, physical exam, some procedures. However, clinical competence involves "not merely a repertoire of knowledge and skills but the capacity to make use of these as demanded by a particular clinical setting.... Clinical competence is better thought of as a kind of creative and flexible capacity to respond to clinical context than as possession of a given set of objectifiable responses to such context."¹⁴ The ability to teach judgment is at the core of many discussions of the adequacy of the competencies to produce clinically competent physicians. Clinical management algorithms are an example of one attempt to provide a "script" for clinical judgment, yet, like the competencies, these cannot include every scenario in a large universe of possible situations; the expert must be, as Huddle points out, "responsive to context" and able to apply clinical judgment to formulate an effective management plan.¹⁴ Similarly, Talbot remarks in his critique of the United Kingdom competency model, "Professional learning is an adaptive and heuristic process; skill-specific training only has a short-run effect unless it is backed up by longer lasting support."¹⁶ There clearly remains a need for educators in colon and rectal surgery to vigorously pursue instruction methods that model instances of clinical judgment being exercised, allow the resident an opportunity to develop his or her own judgment abilities, and encourage open discussion

of the decision-making process without rancor. Structured case discussions and structured oral exams, often used in surgical residencies to probe trainees' judgment maturation, have good reliability; case discussions additionally have relevance, as they involve residents' own patients. However, as with OSCEs, standardized patients, and other simulations, the resident's response is "telling how" rather than "showing how" she or he would manage the clinical situation under discussion. It is worth revisiting Huddle¹⁴ on this (italics are mine): "Clinical judgment *in context* is our quarry.... Clinical competence can be fully assessed *only in actual clinical contexts by those who already possess it*. Assessment must thus be subjective for validity, but this requirement need not sacrifice reliability." Indeed, the operating room and the wards must continue to be learning laboratories of the highest order if we are to continue to train clinically competent practitioners in colon and rectal surgery.

References

- Swing SR. The ACGME outcome project: retrospective and prospective. *Med Teach* 2007;29(7):648–654
- Swing SR. Assessing the ACGME general competencies: general considerations and assessment methods. *Acad Emerg Med* 2002;9(11):1278–1288
- Leach DC. Changing education to improve patient care. *Postgrad Med J* 2008;84(994):437–441
- Holt KD, Miller RS, Nasca TJ. Residency programs' evaluations of the competencies: data provided to the ACGME about types of assessments used by programs. *J Grad Med Educ* 2010;2(4):649–655
- Nuovo J, Bertakis KD, Azari R. Assessing resident's knowledge and communication skills using four different evaluation tools. *Med Educ* 2006;40(7):630–636
- Lurie SJ, Mooney CJ, Lyness JM. Measurement of the general competencies of the accreditation council for graduate medical education: a systematic review. *Acad Med* 2009;84(3):301–309
- Green ML, Holmboe E. Perspective: the ACGME toolbox: half empty or half full? *Acad Med* 2010;85(5):787–790
- Heard JK, Allen RM, Clardy J. Assessing the needs of residency program directors to meet the ACGME general competencies. *Acad Med* 2002;77(7):750
- Joyner BD, Siedel K, Stoll D, Mitchell M. Report of the national survey of urology program directors: attitudes and actions regarding the accreditation council for graduate medical education regulations. *J Urol* 2005;174:1961–1968
- Delzell JE Jr, Ringdahl EN, Kruse RL. The ACGME core competencies: a national survey of family medicine program directors. *Fam Med* 2005;37(8):576–580
- Golnik KC, Lee AG, Wilson MC. A national program director survey of the shift to competency-based education in ophthalmology. *Ophthalmology* 2008;115(8):1426–1430, 1430, e1–e2
- Rakinic J, Cataldo T, Chinn B, Dozois E. Needs assessment of Program Directors in Colon and Rectal Surgery. Unpublished data presented at: The 2010 meeting of the Association of Program Directors in Colon and Rectal Surgery; March 4–7, 2010; Nashville, TN
- Silber CG, Nasca TJ, Paskin DL, Eiger G, Robeson M, Veloski JJ. Do global rating forms enable program directors to assess the ACGME competencies? *Acad Med* 2004;79(6):549–556
- Huddle TS, Heudebert GR. Taking apart the art: the risk of anatomizing clinical competence. *Acad Med* 2007;82(6):536–541
- Lurie SJ, Mooney CJ, Lyness JM. Commentary: pitfalls in assessment of competency-based educational objectives. *Acad Med* 2011;86(4):412–414
- Talbot M. Monkey see, monkey do: a critique of the competency model in graduate medical education. *Med Educ* 2004;38(6):587–592
- Antiel RM, Thompson SM, Hafferty FW, et al. Duty hour recommendations and implications for meeting the ACGME core competencies: views of residency directors. *Mayo Clin Proc* 2011;86(3):185–191
- Cedfeldt AS, English C, El Youssef R, Gilhooly J, Girard DE. Institute of medicine committee report on resident duty hours: a view from a trench. *J Grad Med Educ* 2009;1(2):178–180
- Purcell Jackson G, Tarpley JL. How long does it take to train a surgeon? *BMJ* 2009;339:b4260
- Volpp KG, Rosen AK, Rosenbaum PR, et al. Mortality among patients in VA hospitals in the first 2 years following ACGME resident duty hour reform. *JAMA* 2007;298(9):984–992
- Volpp KG, Rosen AK, Rosenbaum PR, et al. Mortality among hospitalized Medicare beneficiaries in the first 2 years following ACGME resident duty hour reform. *JAMA* 2007;298(9):975–983
- Volpp KG, Rosen AK, Rosenbaum PR, et al. Did duty hour reform lead to better outcomes among the highest risk patients? *J Gen Intern Med* 2009;24(10):1149–1155
- Rosen AK, Loveland SA, Romano PS, et al. Effects of resident duty hour reform on surgical and procedural patient safety indicators among hospitalized Veterans Health Administration and Medicare patients. *Med Care* 2009;47(7):723–731
- Press MJ, Silber JH, Rosen AK, et al. The impact of resident duty hour reform on hospital readmission rates among Medicare beneficiaries. *J Gen Intern Med* 2011;26(4):405–411
- Landrigan CP, Fahrenkopf AM, Lewin D, et al. Effects of the accreditation council for graduate medical education duty hour limits on sleep, work hours, and safety. *Pediatrics* 2008;122(2):250–258
- Poulose BK, Ray WA, Arbogast PG, et al. Resident work hour limits and patient safety. *Ann Surg* 2005;241(6):847–856, discussion 856–860
- Salim A, Teixeira PGR, Chan L, et al. Impact of the 80-hour workweek on patient care at a level I trauma center. *Arch Surg* 2007;142(8):708–712, discussion 712–714
- Van Eaton EG, Tarpley JL, Solorzano CC, Cho CS, Weber SM, Termuhlen PM. Resident education in 2011: three key challenges on the road ahead. *Surgery* 2011;149(4):465–473
- Cohen-Gadol AA, Piepgras DG, Krishnamurthy S, Fessler RD. Resident duty hours reform: results of a national survey of the program directors and residents in neurosurgery training programs. *Neurosurgery* 2005;56(2):398–403, discussion 398–403
- Jamal MH, Rousseau MC, Hanna WC, Doi SA, Meterissian S, Snell L. Effect of the ACGME duty hours restrictions on surgical residents and faculty: a systematic review. *Acad Med* 2011;86(1):34–42
- Hutter MM, Kellogg KC, Ferguson CM, Abbott WM, Warshaw AL. The impact of the 80-hour resident workweek on surgical residents and attending surgeons. *Ann Surg* 2006;243(6):864–871, discussion 871–875
- Curet MJ. Resident work hour restrictions: where are we now? *J Am Coll Surg* 2008;207(5):767–776
- Pape HC, Pfeifer R. Restricted duty hours for surgeons and impact on residents quality of life, education, and patient care: a literature review. *Patient Saf Surg* 2009;3(1):3
- Basu CB, Chen LM, Hollier LH Jr, Shenaq SM. The effect of the Accreditation Council for Graduate Medical Education Duty Hours Policy on plastic surgery resident education and patient care: an outcomes study. *Plast Reconstr Surg* 2004;114(7):1878–1886

- 35 Fletcher KE, Underwood W III, Davis SQ, Mangrulkar RS, McMahon LF Jr, Saint S. Effects of work hour reduction on residents' lives: a systematic review. *JAMA* 2005;294(9):1088–1100
- 36 Reiter ER, Wong DR. Impact of duty hour limits on resident training in otolaryngology. *Laryngoscope* 2005;115(5):773–779
- 37 Auger KA, Sieplinga KR, Simmons JM, Gonzalez Del Rey JA. Failure to thrive: pediatric residents weigh in on feasibility trial of the proposed 2008 institute of medicine work hour restrictions. *J Grad Med Educ* 2009;1(2):181–184
- 38 Jagannathan J, Vates GE, Pouratian N, et al. Impact of the Accreditation Council for Graduate Medical Education work-hour regulations on neurosurgical resident education and productivity. *J Neurosurg* 2009;110(5):820–827
- 39 Vetto JT, Robbins D. Impact of the recent reduction in working hours (the 80 hour work week) on surgical resident cancer education. *J Cancer Educ* 2005;20(1):23–27
- 40 Barden CB, Specht MC, McCarter MD, Daly JM, Fahey TJ III. Effects of limited work hours on surgical training. *J Am Coll Surg* 2002;195(4):531–538
- 41 de Virgilio C, Yaghoubian A, Lewis RJ, Stabile BE, Putnam BA. The 80-hour resident workweek does not adversely affect patient outcomes or resident education. *Curr Surg* 2006;63(6):435–439, discussion 440
- 42 Hassett JM, Nawotniak R, Cumiskey D, et al. Maintaining outcomes in a surgical residency while complying with resident working hour regulations. *Surgery* 2002;132(4):635–639, discussion 639–641
- 43 Simien C, Holt KD, Richter TH, et al. Resident operative experience in general surgery, plastic surgery, and urology 5 years after implementation of the ACGME duty hour policy. *Ann Surg* 2010;252(2):383–389
- 44 Kelly RJ Jr, Senkowski CK. Effect of the night float system on operative case volume for senior surgical residents. *J Surg Educ* 2009;66(6):314–318
- 45 Karamanoukian RL, Ku JK, DeLaRosa J, Karamanoukian HL, Evans GR. The effects of restricted work hours on clinical training. *Am Surg* 2006;72(1):19–21
- 46 Choby B, Passmore C. Faculty perceptions of the ACGME resident duty hour regulations in family medicine. *Fam Med* 2007;39(6):392–398
- 47 Swide CE, Kirsch JR. Duty hours restriction and their effect on resident education and academic departments: the American perspective. *Curr Opin Anaesthesiol* 2007;20(6):580–584
- 48 Relyea-Chew A, Talner LB. A dedicated general competencies curriculum for radiology residents development and implementation. *Acad Radiol* 2011;18(5):650–654
- 49 Frey K, Edwards F, Altman K, Spahr N, Gorman RS. The 'Collaborative Care' curriculum: an educational model addressing key ACGME core competencies in primary care residency training. *Med Educ* 2003;37(9):786–789
- 50 Siri J, Reed AI, Flynn TC, Silver M, Behrns KE. A multidisciplinary systems-based practice learning experience and its impact on surgical residency education. *J Surg Educ* 2007;64(6):328–332
- 51 Fussell JJ, Farrar HC, Blaszk RT, Sisterhen LL. Incorporating the ACGME educational competencies into morbidity and mortality review conferences. *Teach Learn Med* 2009;21(3):233–239
- 52 Rosenfeld JC. Using the morbidity and mortality conference to teach and assess the ACGME general competencies. *Curr Surg* 2005;62(6):664–669
- 53 Kravet SJ, Howell E, Wright SM. Morbidity and mortality conference, grand rounds, and the ACGME's core competencies. *J Gen Intern Med* 2006;21(11):1192–1194
- 54 Stiles BM, Reece TB, Hedrick TL, et al. General surgery morning report: a competency-based conference that enhances patient care and resident education. *Curr Surg* 2006;63(6):385–390
- 55 Sanfey H, Stiles B, Hedrick T, Sawyer RG. Morning report: combining education with patient handover. *Surgeon* 2008;6(2):94–100
- 56 Williams RG, Verhulst S, Colliver JA, Dunnington GL. Assuring the reliability of resident performance appraisals: more items or more observations? *Surgery* 2005;137(2):141–147
- 57 Association of Program Directors in Colon and Rectal Surgery. Homepage. Available at: http://www.apdcrs.org/global_assessment.htm. Accessed December 22, 2011