

CHAPTER 13 THE GRADUATE MEDICAL EDUCATION COMMUNITY'S RESPONSIBILITY FOR PRODUCING A FULLY TRAINED PHYSICIAN

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The Aim of Graduate Medical Education

Today's patients are sicker, and diagnostic and therapeutic options are more numerous, complex, and costly than a generation ago. In response, graduate medical education continues to evolve to educate physicians who can effectively function in this environment. Graduate medical education programs and the institutions sponsoring them are held accountable for ensuring that their graduates have achieved all appropriate competencies by the time that their residency/fellowship training is completed. In a commentary published in June 2003, entitled "Trust, Accountability, and Other Common Denominators in Modernizing Medical Training," Thomas Nasca, MD, MACP, and Jeanne Heard, MD, PhD, FACP described this responsibility of the GME community:

In medical education, we have a greater responsibility than do most other disciplines to not only ensure that our graduates have been exposed to a curriculum that meets national standards for breadth and depth of experience but also to demonstrate that our graduates can actually perform the duties of a specialist in their chosen discipline. Prior to graduation, each resident must demonstrate that he or she is capable of practicing independently.¹

The commentary underscores that as a professional obligation and a consequence of increased public scrutiny, programs and sponsoring institutions must make patient safety their first priority. A concurrent aim of GME accreditation is to ensure that training programs produce fully trained physicians capable of functioning independently in their chosen field. This is central to the mission of graduate medical

education, and the ACGME Common Program Requirements (Section V.A.2.b)² stipulate that programs enter a summative evaluation in each resident's file verifying that he or she has "demonstrated sufficient competence to enter practice without direct supervision." An expected outcome of residency is that graduates will be eligible for initial certification and entry into Maintenance of Certification programs by a member board of the American Board of Medical Specialties. All ACGME Review Committees track board-certification rates of graduates of residency programs as a measure of quality of the programs, and some have as specific requirement that a certain percentage of graduates achieve board certification.^{3,4} These measures are useful but may not present a complete picture of a program's graduates' ability to practice competently and independently.

Hours and the Attainment of Clinical Competence

A critical element of producing a fully competent physician will entail preserving and promoting educationally valuable hours and experiences under the new, more restrictive standards, and using the milestones to ensure that residents are attaining the competencies for independent clinical practice in the specialty. A 2005 systematic review of the literature regarding the effect of interventions to reduce resident work hours on residents' education and quality of life found that that these interventions produced a mixed effect on both experience and on perceived educational quality.⁵

Since the ACGME implemented the common duty hour standards in 2003, questions have arisen about the number of hours required to train a fully competent physician. This is particularly true

for surgical programs, which experienced sizable reductions in duty hours under the 2003 ACGME common standards. To date, relatively little research has assessed the role of operative volume and time on competence for independent medical practice, and proxies from other fields, such as concert pianists, professional athletes, and chess players are being referenced in the literature. These have suggested that it takes approximately 10 000 hours of practice to produce “world class” performance.⁶ A study that applied these concepts to graduate medical education estimated the hours residents spend to complete the procedures required for eligibility for certification by the American Board of Surgery; it found that only 20.6% of the approximately 19 200 maximally available hours for a surgery residency (5 years at 80 hours/week) were spent as a chief surgeon, an assistant, or in preoperative and postoperative care.⁷

While commentaries and early studies after the implementation of the 2003 common duty hour standards postulated a reduction in operative experience under the limits, most studies of programs in surgical specialties have found no decline in operative volume.^{8–11} One study found both a decline in first-assistant experience and in perioperative continuity of care,¹² and experts have commented that preservation of operative volume has come at the expense of resident involvement in perioperative care. In some surgical disciplines, educators have voiced concern about reduced competency and performance in recent graduates, and a study of neurosurgical residents’ board performance on self-assessments and for actual scoring has shown a sizable decline for the cohort sitting for the examination in 2008, as compared to the 2000 cohort.¹³

A critique of this approach to assessing the effect of duty hours on the attainment of skills for independent practice is that it fails to consider the proportion of hours residents may currently spend on activities with comparably low educational value. For more than a decade, the ACGME Institutional Requirements have required that institutions provide transport and

messenger and test retrieval services that reduce resident hours spent on these activities.¹⁴ Analyses conducted during the late 1990s and in the early years of the 21st century have found that a significant proportion of resident time, including time on overnight call, was spent on activities that did not require a physician, did not include direct contact with patients, and may not contribute to the competence for clinical practice.^{15–20} Tasks included charting, other documentation and clerical tasks, time spent waiting and dealing with delays in test results,^{15–19} and time in transit among the clinical areas of the inpatient hospital.²⁰ The findings suggest that institutions have largely eliminated resident time spent in transport of patients and specimens. However, it is not clear to what degree programs and institutions have enhanced the educational value of resident hours by reducing these other more subtle and difficult-to-address areas of work with lower relevance to the acquisition of competence.

Problems with reducing activities of lower educational value and preserving formal education contract hours are reported from the European Community, which has functioned for more than 15 years under restrictions on work hours for all physicians.^{21–24} Some studies have reported declines in experience and in the comfort level of residents and faculty for graduates’ preparedness for independent practice, yet viewed collectively, the findings are not conclusive in allowing an assessment of the educational effect of the European duty hour limits.^{25–30} However, a recent study³¹ suggested comparably lower competence in medical decision making and patient management skills for physicians recently entering practice in the Netherlands, compared to their Canadian counterparts, who were educated under duty hour limits similar to those in the United States.

Assessing Acquisition of Competence and Readiness for Practice

Concerns about the effect of duty hour limits on the acquisition of competence for practice has further heightened interest in competency-based

education and assessment.³² Competence in the realm of *medical knowledge* has long been determined by using standardized examinations (ie, in-service and board-certification examinations).³³ For the 5 other competencies, expectations for competence and methods of assessment are not as clearly defined, and written or computer-based examinations are not the ideal means to assess professionalism, interpersonal and communication skills, practice-based learning and improvement, or systems-based practice.^{34–37} These assessment mechanisms also are not well suited to the assessment of haptic, higher-order, or integrated skills that must be fully developed before a physician is able to practice independently.³³

The ACGME formally implemented the Outcome Project in 2002, to expand the formal assessment of resident physicians to all 6 competencies, with the aim of assuring the public that graduate medical education is meeting its societal obligation of producing fully trained physicians capable of providing independent patient care.³⁸ While the Outcome Project significantly advanced teaching of all 6 competencies, evaluation of residents to date largely has been limited to formative assessment using relatively simple, locally developed tools that frequently have undergone little or no validation, or using global “cross-competency” faculty ratings of residents after major rotations. The lack of nationally applied and validated assessment tools makes it impossible to conduct national comparisons of resident performance with the aim of identifying best practices and benchmarks.

The Milestone Project

To enhance the systems for tracking the development of residents as they aim to become fully competent physicians, the ACGME in 2008 initiated the Milestone Project as a major effort to move toward competency-based education.³⁹ Under the Project, the ACGME is working with its Review Committees and specialty boards to develop specialty milestones—clear, specific

accomplishments relevant to the specialty that residents must achieve at specific times during their education.^{40,41} The measure of a fully competent physician ready for entry into practice would be the completion of all education milestones in the specialty.

The goal of the Milestone Project is to set discipline-specific standards for performance over the course of the required years of training by using the progression from beginner to proficient/expert as defined by Dreyfus and Dreyfus.⁴² The timing of these assessments will be the biannual, more formal evaluations of resident progress, which are already required by the ACGME for all programs and are an accepted approach in residency education. The approach is justified by educational research and will improve the quality and consistency of the assessment of residents in all competencies and, through this, their education and preparation for practice. By having discrete and clearly outlined milestones in place, programs will be able to better plan the major curricular elements of the program, thus ensuring that residents have more uniform, and yet tailored, educational experiences. It also is thought that the milestones will offer clearer guidance for assessment of residents’ readiness to be declared “competent” in given domains.^{40,42} By offering national comparisons, programs will be able to benchmark their achievements, and sharing of best practices by high-performing programs may accelerate the pace of innovation and improvement in GME. Finally, the Milestone Project incorporates the understanding that learners’ pace of acquisition of competence may differ and, moreover, that by being able to identify learners who require additional experience in a given area at various predetermined times during the course of training, programs can more easily provide such experiences.⁴²

At the time of writing, 5 specialties (internal medicine, pediatrics, surgery, obstetrics-gynecology, and urology) are nearing completion or have initiated the development of specialty-specific milestones. Other ACGME Review Committees are

slated to commence with development of milestones in the near future, and plans call for the completion of this effort for all core specialties in 3 to 5 years. With the implementation of the Milestone measures, programs and institutions will be able to demonstrate with greater confidence and credibility that their graduates have mastered required goals and are competent to enter independent practice.

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