A Major Challenge for Graduate Medical Education

L. D. Britt, MD, MPH

Arguably, the most pivotal period in medical education in this country was during the early 20th century when a nonphysician was given the task to objectively evaluate medical education in America. Abraham Flexner, an educator who worked at the Carnegie Foundation for Advancement of Teaching, provided a critical analysis of an educational system in medicine that had no regulatory body or structured curriculum. This landmark report on Medical Education in the United States and Canada was unveiled in 1910.1-3

The “Flexner Report,” as it is commonly called, highlighted that a large percentage of medical schools were strictly proprietary. Very few had any type of standards or required prerequisites prior to matriculation. In fact, most medical schools were faculty owned, with tuition funding most of the faculty salaries. The majority of the medical schools during this period had no hospital or university affiliation. It was reported that some of the graduates from these schools never dissected a cadaver and often did not see a single patient. The shocking conclusion of the Flexner Report was that more than 120 of the 150+ operating medical schools should be closed. The report generated a quick response from the American Medical Association’s Council on Medical Education, which initiated the following rating system: class A, fully satisfactory; class B, redeemable; and class C, complete reorganization needed. With most of the states denying licensure to new graduates of class C schools, it resulted in almost immediate closure of the schools in this category. If they did not close outright, the class B schools often merged with other schools to survive. As predicted, more than 100 medical schools eventually closed. An unexpected consequence of the Flexner Report was the increase in philanthropic funds to the medical schools with almost half of the funds given to all causes being directed to undergraduate medical education. Approximately $154 million (excluding matching funds) were poured into medical schools.

Fortunately, medical schools today are more stable. However, they still face major challenges, including a steady decline in applicants to US medical schools (Figure 1). In the 1996-1997 academic year, there were approximately 47,000 applicants to US medical schools. Recent years have had lower applicant pools of fewer than 35,000. Even though there has been marginal reversal of this trend for the 2003-2004 academic year, there is still a decline in the number of Hispanic and African American students attending US medical schools. The educational debt of the medical graduates is likely one of the main deterrents. Most medical school graduates have a loan debt of more than $100,000 before starting 1 day of internship (Figure 2). Also, with decreasing salary compensation and the omnipresent threat of inappropriate malpractice litigation, college graduates are choosing not to pursue medical careers.

Graduate medical education in surgery had a similar beginning because before 1889, there was no formal graduate medical education system in surgery. Most surgeons were either self-taught or trained under a rudimentary apprenticeship arrangement that offered no more than 1 or 2 years of surgical experience in a hospi-
tal setting. Credit is appropriately given to William Stewart Halsted, MD, for establishing a university-sponsored, hospital-based surgical training program that, over a several-year period of increasing responsibility, slowly led to the training of young surgeons who were well versed in anatomy, pathology, bacteriology, and physiology.4(p445),5

Halsted’s main educational goals were knowledge of basic sciences, research, and independent operating responsibilities. Although Halsted’s contributions to the medical profession are many (including advancing the fields of breast, biliary, and pancreatic surgery and introducing the concept of “safe” surgery with an emphasis on meticulous surgical dissection), perhaps his greatest contribution was the development of formal residency programs.

Figure 1. Decline in applicants to US medical schools, 1994 through 2002 (reproduced with permission from the Association of American Medical Colleges).

Figure 2. Median educational debt of indebted graduates (A) and the educational debt of 2003 medical school graduates (B) (reproduced with permission from the Association of American Medical College Graduation Questionnaire). Of the 2003 medical school graduates, 4.6% were more than $200,000 in debt.
training. The impetus for such an initiative came from Halsted’s European experience, particularly with the Gemanic system of training surgeons. As described by Halsted, such a training system would “produce not only surgeons, but surgeons of the highest type. . . . ”[p453] Over the ensuing decades, graduate medical education in surgery has undergone necessary modifications; however, many of the basic Halstedian tenets still remain.

Overwhelmed by many daunting challenges (eg, the uninsured-underinsured, workforce shortages in health care, unacceptable medical errors, medical liability, compliance demands, decreasing physician reimbursements, technological revolution, and others), the medical system today is in a crisis. Health care expenditures are 16% of the gross national product, which is substantially more than any other nation. In fact, the health care industry is the only trillion dollar industry in the nation. Perhaps a rationale for such spending could be made if the nation could boast about providing the highest quality of health care for all. However, the antithesis is actually the case with an infant mortality (6.9 deaths per 1000 live births) that fares poorly with other industrialized nations. The medical system today is in a crisis. Health care expenditures are 16% of the gross national product, which is substantially more than any other nation. In fact, the health care industry is the only trillion dollar industry in the nation. Perhaps a rationale for such spending could be made if the nation could boast about providing the highest quality of health care for all. However, the antithesis is actually the case with an infant mortality (6.9 deaths per 1000 live births) that fares poorly with other industrialized nations and a global health care ranking, by the World Health Organization, that lists the United States at number 37.

Oftentimes, under the ruse of attempting to control the rapidly escalating health care costs, managed care initiatives infiltrated the health care system. With stringent business principles, the managed care organizations pushed cost-efficiency and supply-demand formulas that were better suited for corporate America than for the medical profession. Market forces unleashed to create a profit center were not uniformly applicable in an industry in which equitable quality health care delivery and access for all are the overriding missions. The key beneficiaries of the profits generated were infrequently the patients or the physicians and more commonly, the health care executives.

During this era of market-driven medicine with very little revenue being channeled into shrinking financial coffers of the medical institutions and with much of the physicians efforts being directed toward revenue generation, graduate medical education has, overall, suffered a severe setback. In addition, the limitations of graduate medical education funding, sex and racial disparities, a 20% attrition rate in general surgery residency programs, new Accreditation Council for Graduate Medical Education (ACGME) requirements, and other regulatory mandates (eg, Health Insurance Portability and Accountability Act of 1996) have placed surgical training in a vulnerable state. In fact, there has never been a time (post-Halstedian) in which there have been so many major challenges to the core missions of graduate medical education in surgery. From 1997 through 2004, general surgery surfaced from a period of specialty apathy when there were unprecedented vacancy numbers in categorical positions in general surgery training programs. During this period the unfilled National Residency Match Program vacancies by US medical school seniors were as follows: 6 in 1997, 24 in 1998, 39 in 1999, 19 in 2000, 68 in 2001, 58 in 2002, 11 in 2003, and 2 in 2004.

The leaders in surgery must definitely address all the mounting challenges with the same fervor Flexner and Halsted had and revamp, or overhaul, surgical training essentially creating a Halstedian 2 era. For example, perhaps, the new ACGME requirements (80-hour workweek limitation, the 6 general competencies, and other issues) should be embraced as telltale signs of a need for change. It is unlikely that the filling of the previously vacant categorical positions in general surgery (with an increase of US medical school seniors) would have occurred without the ACGME duty having limitations. The ACGME mandate to specifically address the 6 general competencies will also have a similar positive effect. The general competencies (ie, patient care, medical knowledge, practice-based learning and/or improvement, interpersonal and communication skills, professionalism, and system-based practice) represent 3 basic categories: fund of knowledge, skills, and clinical application. These should not be considered new concepts for Aristotle included these competencies in his concept of learning (ie, episteme [knowledge], technè [skills], and phronèsis [practical wisdom]).

It should not be assumed that any one of the competencies is intuitive just because someone has successfully completed the minimum undergraduate and graduate medical education requirements. Also, any competency deficiency can prove problematic later in a person’s career. Papadakis et al7 convincingly addressed this point when they highlighted the association of unprofessional behavior in medical school and subsequent disciplinary action by a state medical board. In fact, 26% of adverse licensure actions at the state medical boards are a result of general unprofessional conduct, which is separate from more specific violations such as substance abuse, sexual misconduct, inappropriate prescriptions, fraud, and unlicensed activity.

Also, the proposed curriculum should include clinical skills, assessment tools, and a deceleration curriculum. In addition to the 6 general competencies (merit based rather than time based), a proposed new curriculum should include administrative management because it is sorely lacking today from the curricula of graduate medical education in surgery. This would include management practice management skills, financial accounting, compliance training (eg, Health Insurance Portability and Accountability Act of 1996 standard compli-

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Table. Dreyfus Learning Continuum (Modified)*

<table>
<thead>
<tr>
<th>Level</th>
<th>Knowledge or Skill Requirement</th>
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<tbody>
<tr>
<td>Novice</td>
<td>Knows the basic rules/principles</td>
</tr>
<tr>
<td>Advanced beginner</td>
<td>Knows the rules/principles and the clinical application</td>
</tr>
<tr>
<td>Competent</td>
<td>Knows the rules/principles and applies them in the clinical setting with accountability</td>
</tr>
<tr>
<td>Proficient</td>
<td>Competent and intuitive</td>
</tr>
<tr>
<td>Expert</td>
<td>Immediately sees the problem or situation</td>
</tr>
<tr>
<td>Master</td>
<td>Clearly sees the problem/situation and knows how to address it immediately</td>
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ance), legislative advocacy, and practice building and recruiting activities.

With respect to evaluation of clinical skills, there should be high-stakes assessment tools that are valid and reproducible, similar to what is being used by the United States Medical Licensure Examiners (USMLE) for the clinical skills examination component of USMLE II. The Medical Council of Canada has been administering clinical skills examinations for several years prior to granting licensure.

A deceleration curriculum will be for the surgical resident who would prefer completing the identical curriculum on a part-time basis because of personal or family demands or obligations. The National Resident Match Program does allow for this type of tracking for some specialties. The graduate medical education funding for this position could be adjusted on a full-time equivalent basis to make such an arrangement essentially budget neutral.

A proposed conceptual model of the new curriculum for graduate medical education in surgery incorporates the Dreyfus continuum of learning (Table) in the 6 core competencies with outcome measures at each level (Figure 3). The “novice” will likely be the senior medical student or intern with the “advanced beginner” being the junior resident. The “competent” and “proficient” levels should correspond to the intermediate and senior resident levels, respectively. While it should be the goal of the training program to finish the chief resident, who is able to practice independently, it is highly unlikely that a trainee will reach the “expert” level by the end of the residency or fellowship training. If the expert status is to be achieved, it will be at the practicing surgeon and/or attending stage. Although not an original level of the Dreyfus continuum of learning, very few will ever obtain the “master” level.

With such an expanding body of knowledge and the steady development of advanced technology, the question that needs to be answered is how will surgical residents be able to achieve these benchmarks with the current duty hour limitation? These levels of advancement can, indeed, be achieved by appropriately streamlining residency training by preserving the true educational elements of the program (patient care, operative skills, formal education sessions, and others) and diminishing the menial service components. Essential adjuncts to the curriculum will be Web-based learning and simulation training and/or testing.

The year 2010 will be the 100th anniversary of the 346-page Flexner Report that was responsible for the most dramatic reform in undergraduate medical education. Hopefully, this important anniversary will correspond with a major renaissance period for graduate medical education.

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REFERENCES