The evolution of medical education

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GRILLO'S ADDRESS BRINGS INTO focus the issue of surgical education as it has progressed through evolutions and revolutions. The author's historical recapitulation needs little amplification and certainly generates a sense of pride in all who have participated in what Grillo rightly assigns the appellation "the best surgical training in the world." But just as the sensitivity and resistance and consequent virulence of pathogenic bacteria are ever-changing phenomena, so are the problems and incursions faced by surgical education. In the current environment there are 2 major problems serving as stimuli for change in the content and process of surgical education.

As is the case in microbiology, one of the problems stems from our success. In the bacterial drama, penicillin and increasingly sophisticated antibiotics conquered pathogens and effected cures previously unattainable. Then new bacteria evolved, against which the heralded antibiotics were ineffective. The analogy in the arena of surgical education is the explosion of scientific knowledge that requires incorporation into the current educational schema so that it is translated into optimal patient care. The entrusted caretakers of surgical education must incorporate 2 diametrically opposed vector forces, one from the past and one from the future, to develop an effective form of surgical education and training.

The changes in surgical science and surgical care have recently occurred with such unparalleled speed that current problems facing surgical educators are unique. The speed of change has resulted in a scenario where the more senior educators, usually those responsible for the structure and format of educational programs, are the least informed about modern elements. How many chairs or program directors are comfortable with the language of immunobiology, genetic identification and manipulation, and the nuances of minimally invasive surgery? How many of those who teach are truly appreciative of the potential of computer applications and virtual reality as educational tools?

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In a time of unrivaled rapid changes, the most inappropriate principle of education is replication. The "core surgical education" requires redefinition with full appreciation that the "core" is a moving target. In establishing the "core," it must be understood that, just as in the case of the flora, the core includes the seeds for perpetuating the successes of the present and the evolution required for the future. But equal, if not more essential than curricular issues, are the personal contributions of teachers, mentors, and role models. The answer to the question "What have been the greatest influences on a career?" usually evokes the response "teachers and mentors." There is a concern about teachers, particularly in the surgical sciences, which continues to have a large preceptorial component. Does the system, or more important, will the future system, recognize the importance of those who "educate," or as the Latin origin of the word specifies "lead out," the student? Does the individual educator or mentor hold the privilege and obligation to help the new players become meaningful character actors and stars as a priority?

The other problem comes from another direction and also is the product of recent times. To again invoke the microbiologic metaphor, it is analogous to the appearance of a new virus, an Ebola or acquired immunodeficiency syndrome epidemic. The virus that currently attacks education evolved from the change in the health care environment and flourished in a culture medium in which the nutrient was cost containment unaccompanied by quality of care. The manifestations of the viral infection of our academic medical centers and our surgical education programs are relat-

ed to managerial concerns that have discounted or reduced the importance of educational considerations. Academic imperatives have been moved down on the list of priorities, below fiscal success, maintenance of patient flow, building practice networks, amalgamations, and acquisitions.

Medical students are now "exposed" to surgery rather than educated. Residents have become functionaries, essential relatively low-cost players in health care delivery systems. The consumption of their time and energies by the demands of work minimize their learning capabilities just as the need to generate income reduces the time that the faculty has to spend in its role as educator, mentor, and role model.

The model of strong clinical and scientific leaders working from individual platforms of expertise to create the strongest possible educational amalgam is threatened by a corporate structure with a chief executive officer and chairs serving as middle management. This would be an acceptable alternative if the leaders accepted the premise that the raison d'etre of an academic medical center is to draw from the faculty's expertise in scholarship, research, and clinical care to educate and train for the present and the future. Good community hospitals provide good care; research institutes expand the boundaries of science; only academic medical centers educate students and residents.

Grillo's historical review, which incorporates the changes in medical school education, improvements in standards of care, developments in residency training, and assessments, provides a list of extraordinary accomplishments. It also emphasizes that we are capable of change and resolving major problems. It forms the basis for the optimism that is required to address the current problems. The very nature of the surgeon to make a timely diagnosis, rapidly develop an appropriate treatment plan, effect the plan, and critically assess the results is integral to the process of resolving problems that we currently face. The hope is that a future presidential address will include in its chronology of accomplishments the successful resolution of the current problems and that the conclusion includes the assessment that surgical education and training in our country has achieved even greater heights.

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