You Know I Can't Hear You When the Water's Running

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ONE cannot profitably discuss postgraduate medical training without implicating medical school education, for it is in the latter that the twig is bent. Neither should we close our eyes to the rapid transformation of medical technology and the inexorable changes in social philosophy and health legislation. All these have altered and will continue to alter profoundly the physician-patient relationship and traditional medical pedagogy. A workshop such as this cannot offer solutions to problems peculiar only to our specialty, because they are common to the entire field of medical education. I choose to consider first, then, the general dilemma and proceed to the specific. Such a separation is probably specious; the redundancy is so great that the between-group difference becomes of dubious validity.

Changing Phenomena

In the common or general field of medical education I would list certain changing phenomena. Unlike many fields of endeavor, the physician is expected to be both "a thinker and doer." Since the beginning, man has been a "doer." His application of knowledge to technical ability has increased arithmetically, and over the millennia the acquisition of information has run a parallel course. However, in recent years, the latter has risen exponentially, the so-called information explosion. Not long ago an entire generation gap existed between concept and application; it now approaches ± months. Moreover, the half-life of medical knowledge is approximately 5.5 years; before a student completes his graduate and postgraduate education a substantial portion of his fund of information is obsolescent, if not obsolete.

Although we are probably still doing a reasonably good job in producing technicians (doers), our educational system is without the flexibility required to alter its pace and direction to cope with the challenge of burgeoning information and its application to both patient and community needs.

If the primary goal of a medical school is to produce competent physicians and orient them toward continuing education—be they generalists or specialists—then our present approach is antithetical to this concept. We are overwhelming the eager young student with a conglomeration of unessential and often irrelevant data at a point in time when he is most receptive to learn the art, logic, and science essential to the diagnosis and treatment of disease. When the physician has reached maturity (the point in time at which he recognizes his own deficiencies in the fundamental medical disciplines, and/or has the desire to study a specialty field or biomedical science in depth), he is too old; worse, he is confronted with the reality that no mechanism exists in our present academic system to enable him to fulfill his needs reasonably and efficiently. Witness the plight of a resident physician who, despite all, is still a highly motivated student who has both the desire and the professional requirement to advance himself in one of the basic sciences. The time lost is irretrievable, and the loss of potential output is both incalculable and awesome.

Problems

What are the specific criticisms of our present residency programs? These I would list as follows:

1. Repetitious "scutwork" starts in clerkships and extends through the intern and resident years. When does experience by repetition cease being educational and become purely service? This type of so-called education can shift quickly from the role of a stimulant to that of a narcotic.

2. Undergraduate and postgraduate medical education is archaic; moreover, it takes too long, and consequently deters
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the bright and ambitious.

3. There is inadequate time for selective and elective study.

4. Training is hospital-based rather than university-based. This prevents true postgraduate training since the university has no responsibility past the M.D. degree. No mechanism exists for “re-entry” into basic science or other departments, which is propaedeutic to continuing education and “updating” so mandatory today.

5. Undergraduate education and training programs are inherently rigid because they are based on the assumption that all students have substantially the same ability to learn, the same needs, motivations, and talents. But one hat will not fit all heads!

6. These factors combine to place us in a poor competitive position to attract bright young people into our neurosurgical specialty.

William Mayo, some 35 years ago, stated that, one of the chief defects in our plan of education in this country was that we gave too much attention to the development of the memory and too little to the development of the mind. Osler’s commentary remains contemporary and cogent: “We expect too much of the student and we try to teach him too much. Give him good methods and a proper point of view and all other things will be added as his experience grows.” The problems have not really changed and have often been discussed; but so far, no great effort has been made toward their solution. The problems have now reached critical mass. The ever-increasing psychosocial tempo makes it mandatory that we address ourselves to a solution and act with alacrity and imagination lest we be inundated.

Solutions

We may be like Socrates who asked all the important questions but never answered any. Vituperation and damning criticism can be useful only if they lead to creative thought and effort. Let us examine, in the broad sense, two basic ways to attain the objective of producing a modern competent physician and concomitantly provide him with the facilities and resources to maintain this high level of competency.

The usual approach has been simply to add years to the training program. Because of the short half-life of medical knowledge, this is self-defeating and makes no attempt to answer the problem of maintenance of competency or “updating.”

I espouse a diametrically opposite point of view, believing that the only hope for the future is to shorten and hasten the initial training period and set up a mechanism for continuing education. Many years are available for this if redundancy in education is eliminated and the student is admitted to medical school while he is maximally interested and venturesome. Today the basic prerequisite is an understanding of the symbolic language of mathematics and chemistry which is now taught in high school! The student can quickly be taught problem-solving (the best known methodology of diagnosis) and therapy. The salient feature in a continuum of education is not to destroy time; if time is not lost the physician can always come back to pick up new knowledge. Other advantages are inherent in this concept; the shorter term goals are reached more quickly, and the sense of accomplishment enhances motivation for continuing education. Perhaps the quiddity of what I am trying to say is captured in a quotation from Latham, “When you teach a man to read, you do not begin with the history of words.”

I would submit the following specific proposals for your consideration: experimental programs should be set up in selected schools. Ideally the university should assume the responsibility for postgraduate education. This would help close the gap between the preclinical departments (basic sciences) and the clinically oriented services by promulgating interdisciplinary departments, divisions, institutes, or units which would be dedicated to the earlier acceptance of students and the earlier introduction of clinical medicine with only the minimum of basic science knowledge essential to the treatment of disease. This is not unreasonable when one realizes that the basic sciences are no longer the glue which binds together a medical education. For example, physiology is moving away
from organs and systems into the realm of cellular biology. Classic physiology is in fact being taught by clinicians.

There should be more selective time for the student; if he elects to "specialize" early this should be counted towards his "Board time."

Concomitantly there should be more elective time for the resident. With the integrated disciplines functioning as a graduate and postgraduate school, the resident would then have ready access to the basic scientist, who, with his decreased mandatory undergraduate teaching load, would welcome the motivated and mature resident as a prime student. Under the prevailing structure, the non-clinical education of the resident is all but impossible and when accomplished it is usually only by duplication of effort.

When possible, the internship and 1 year of required general surgery should be combined. The year of servitude in general surgery should be replaced by an intensive 6-month course that includes didactic instruction in fundamentals and principles and animal operative technique. The second 6 months should consist of an exposure to the diagnosis, surgical treatment and postoperative care of selected appropriate cases and emergency care. This should be so designed to exclude the slave labor aspects and reduce pure patient service time to a minimum.

Program directors should have complete freedom in determining the length, time, and content of the postgraduate course. This would break up the traditional lock-step and allow the flexibility needed to let the resident move through at a pace commensurate with his ability.

Inherent flexibility would provide the opportunity for resident exchange, re-entry of the practitioner for updating, etc. The Board should accept the trainee for examination at a time recommended by the program director.

It is paramount that some type of organizational structure and lines of communication be set up between the examining board, program directors, and residents, for planning, feedback, evaluation, and exchange of ideas. All involved should "have a piece of the action." It would be appropriate for the program director to make a serious study of such needs and restructure programs so that they would render service and broaden the educational experience for both the trainee and the practitioner.

Because of an admitted bias, I have left until last my comments on the place, if any, of the research laboratory in the training program. I am of the conviction that, for lack of creative thought and imaginative productivity, neurosurgeons are rapidly becoming second class citizens in the scientific world. I submit that a good laboratory background is mandatory; not only would this maintain a supply of experimentally oriented neurosurgeons for laboratory and teaching posts, but those primarily clinically oriented would be improved by the exposure. In the words of Zimmermann,

"Clinical medicine is an investigative process, and it is hard to believe that a genuine talent for diagnosis would not be accompanied by an interest in exploring the unknown; but even more valuable is the discipline involved in constructing valid conclusions from observations. The competent specialist must practice very close to the advancing frontiers of scientific knowledge in his field. He should be able to evaluate an enormous welter of data, literature and scientific claims."

There is every doubt that the best clinicians can only evolve from a life-long application of the investigative discipline. When, in the continuum of education, the initial exposure occurs is unimportant. What is important is where. Realistically, this experience can only be significant if the student is sent to a center that has the expertise in the area of his specific interest. To paraphrase Austin, it demands the largest possible infusion of scientific teaching, during professional pupilage, to balance the empiricism of medical practice.

The message is clear; no matter what the mechanism or organizational structure, the time has come for "a controlled revolution." As put by Martin Fischer, "The new appears as a minority point of view, and hence is unpopular. The function of a university is to give it sanctuary."