Clinical Laboratory Scientist Training—A Need for Reform

Training individuals for careers in laboratory medicine is influenced by the pressures of healthcare reform. Although good current data are unavailable, an estimated 10% of the total US healthcare expenditure is for laboratory procedures (1). This represents almost $90 billion of the $884 billion healthcare expenditures in 1993 (2). Along with healthcare reform are new factors markedly influencing the practice of laboratory medicine. Factors include enhanced roles for primary care physicians and for paramedical specialists (i.e., midwives, physician assistants, pharmacists, etc.), additional pressures generated by capitation, the continuing problem of limited access to healthcare, and a new emphasis on cost-effectiveness.

The article by Scott and Sacks in this issue of Clinical Chemistry (3) is, therefore, particularly relevant. By focusing on training programs for clinical laboratorians, it emphasizes the need to address the new roles that will be played by laboratory professionals, regardless of degree, in a reformed healthcare system. The authors surveyed directors of medical technology, postdoctoral clinical chemistry, clinical pathology only, and combined anatomicclinical pathology training programs. The objective component of the survey reveals generally expected results about the placement of individuals into private hospital vs university and research settings. For example, >60% of medical technology graduates work in private hospitals. The majority (55-65%) of the combined anatomicclinical pathology trained pathologists enter primarily service jobs. Pathologists trained only in clinical pathology are placed primarily in academic settings (83%)—which is not surprising, given the fact that they are generally preselected for this pathway. Straight clinical pathology has become an excellent career path for academic "triple-threat" individuals, who want to make contributions to service, research, and teaching (4). Of the clinical chemistry graduates, 28% and 25% enter positions that emphasize service and research, respectively. These positions are in either private hospital or university settings.

In contrast to these objective aspects of the survey, the opinions of the program directors are most interesting, and several key points are worth highlighting. First, the fact that anatomicclinical pathology program directors do not anticipate problems placing graduates is somewhat surprising—and may no longer be true. The time when the surveys were conducted is most relevant. Healthcare reform is moving so rapidly that as little as 6 months can make a significant difference in the outcome of such surveys. Our experience at the University of Alabama at Birmingham is that anatomicclinically trained pathologists have not, through 1994, had trouble locating excellent job opportunities. However, each year is a new challenge and the verdict for this year is unknown. Program directors predict that fewer anatomicclinical pathology-trained residents are seeking subspecialty training. Scott and Sacks state that this "seems consistent with the anticipation of fewer specialists in the managed care environment." My perception, however, is that more individuals are seeking subspecialty training and that this may reflect a decreasing number of permanent jobs available. Despite the fact that some manpower surveys support the need for more pathologists (5), such surveys are performed by pathologists and are thus suspect. In general, manpower surveys performed in medicine by specialty and subspecialty organizations conclude that more trainees are needed in their specific areas, but such conclusions are often not supported by independent study. For example, Wennberg et al. (6) determined that there was an excess supply of pathologists and estimated that there are 3.1 times more pathologists than needed. Although their data and approach are questionable, they are not likely to be completely wrong.

The biggest problem facing the laboratory PhD scientist is that the skills being emphasized in clinical chemistry training programs are limited in scope and do not reflect the broad-based skills required in our new healthcare environment. An interesting aspect of this is illustrated in Table 6 in the article by Scott and Sacks (3), which shows a marked discrepancy between what the directors themselves rank as important for the future and the actual percent effort devoted to those facets of training. Whether or not the priority list is correct will not be addressed here, but the fact that the programs have not been adjusted to match the priorities of the program directors themselves seems inappropriate and indefensible. For example, the most important two components of training, as determined by the training program directors themselves, are "QA/QC and service," which together represent only 19% of the training effort. In addition, in this era of healthcare reform, in which information systems provide the basis for patient care and evaluation, it seems inappropriate that only 45% of the training time is devoted to informatics training for residents and clinical chemists alike.

As chair of a department of pathology, I do not believe that the future economics of healthcare reform will afford me the luxury of hiring individuals in each
laboratory subspecialty to handle specific laboratory subspecialty service problems that actually cross multiple subspecialties of the laboratory—e.g., informatics, quality assurance/ improvement, and utilization management. Nor do I need laboratory specialists who have a myopic view of the laboratory as a single independent entity. Rather, I am seeking individuals who can apply their unique knowledge not only to all areas of the laboratory but also outside the laboratory—to the entire healthcare system.

Clinical chemistry training should be reformed. Training program reform has been initiated for clinical pathology with the release of the Graylyn Conference Report (7), the result of a multiple-society effort to modify training to match the needs of a reformed healthcare system. Most important in this report are the competency characteristics listed for clinical pathologists, characteristics that emphasize contributions both within and outside the laboratory:

1) Serve as a consultant to physicians on cost-effective test strategy and interpretation of results.
2) Select, evaluate, and apply laboratory instruments and procedures appropriate to the screening, diagnostic, and monitoring needs of clinical decision-making.
3) Plan, organize, staff, and direct laboratory resources.
4) Use the techniques of medical informatics to acquire and manage data, translate data to clinically useful information, and communicate that information in support of patient care and educational programs.
5) Play an influential role in medical staff and healthcare delivery activities that reach beyond the confines of the laboratory.

A similar effort to reform training programs for clinical laboratory PhD scientists is required. This should not be limited to clinical chemists, but should include microbiologists/immunologists and other PhD clinical laboratorians. Focusing on delivering system-wide value-added medically relevant services, such as those listed in Table 1, will be the key to success. These seven services are not new concepts, nor do they represent a comprehensive list of value-added services provided by laboratory professionals. Rather, they were selected because in each category listed here the service for which laboratory professionals are uniquely trained has broad applicability in the healthcare system. For example, point-of-care testing management can be applied in nursing homes, pharmacies, home healthcare programs, and even self-administered tests. Similarly, the laboratorian's expertise in information systems, resource and utilization management, quality assurance/ improvement, and technology assessment have applications well beyond a specific area of the laboratory or even the entire laboratory. We must therefore train individuals to apply these unique skills not only beyond a specific area of laboratory subspecialization, but also beyond the confines of the laboratory.

To accomplish this, PhD laboratory scientists should unite, define their goals, and construct new training programs, so that the fields will not perish in an era of healthcare reform. This concept is not new. A union of laboratory medicine organizations to be focused on common goals and problems was proposed more than 10 years ago (8). Training reform should emphasize a broad-based multilaboratory core followed by subspecialization in areas not confined by traditional disciplines. The core should address general skills applicable to all areas of laboratory medicine, including, for example, those areas listed in Table 1. Examples of subspecialty areas, many of which are multidisciplinary, include molecular diagnostics, medical informatics, outcomes analyses, genetics, and epidemiology, to name a few.

The value and service to the profession of the survey presented by Scott and Sacks are that it has identified, as objectively as possible, the problem that faces laboratory professionals at its roots—in our training programs.

References

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Table 1. Value-added and medically relevant services in laboratory medicine.

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<td>Resource management</td>
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