Clinician-Scientists in Ophthalmology

It has been almost 10 years since the viability of the clinician-scientist in ophthalmology was considered in an ARCHIVES editorial. At that time, Epstein opined that many departments of ophthalmology had turned away from supporting clinician-scientists. The economic imperative of increasing patient care activities to compensate for shrinking clinical reimbursements was a central reason, among the several, that he identified as contributing to this emerging phenomenon. Even though it was likely that health care economics would be increasingly factionalized, he concluded by advising the aspiring clinician-scientist to pursue this choice of careers as it was not only needed, but would provide opportunities for personal satisfaction and achievement.

Since the publication of his editorial, there continue to be questions about the survival of the clinician-scientist in ophthalmology and whether this is still a viable career path. The past several years have been marked by financial instability of academic medical centers and their departments of ophthalmology. Moreover, despite the explosion of biomedical discovery and new opportunities for vision research, many academicians are even more pessimistic about the viability of the clinician-scientist. Therefore, it seems appropriate to reassess the subject. Who are the clinician-scientists in ophthalmology, and are they needed? Should they be supported and sustained? And if so, how?

WHO ARE THE CLINICIAN-SCIENTISTS IN OPHTHALMOLOGY?

In addition to having completed an ophthalmology residency, clinician-scientists perform laboratory-based or clinically oriented vision research and continue to have direct patient contact. Some may argue that those ophthalmologists who participate solely in research and who do not have direct contact with patients also are clinician-scientists. Perhaps this is appropriate; however, some issues may be unique to this group and, therefore, these individuals will not be the focus of this discussion.

ARE CLINICIAN-SCIENTISTS NEEDED IN OPHTHALMOLOGY?

Clinician-scientists have a unique role in ophthalmology. Some identify clinically relevant questions that they seek to answer in the laboratory. Often this research is disease oriented, investigates the pathophysiology or treatment of disease, and is not directly dependent on patient contact. Other clinician-scientists solve problems through rigorous clinical investigation that involves direct contact with patients with whom they have been trained to interact and provide care. Still others translate laboratory discoveries into new methods for diagnosis, prevention, and treatment of eye disease. Clinician-scientists have the training and skills to ensure that human subject protocols are appropriately designed and evaluated.

One successful pathway for advancement in medical science has been based on observations of the clinical situation, hypotheses to explain the observation, laboratory testing to prove (or disprove) the hypotheses, and return to the clinic for testing. Clinician-scientists are uniquely positioned to initiate and complete this cycle because of their combination of clinical and scientific skills that are essential to change and improve the understanding and amelioration of human vision disorders.

Clinician-scientists do more than vision research, however. They are educators who teach medical students, graduate students, residents, postdoctoral fellows, scientists, and other ophthalmologists about the scientific foundations of ophthalmology. They also mentor the next generation of clinician-scientists. Clinician-scientists fill the void between the laboratory and the clinic and provide the best interface between the scientist and the practitioner. They also are advocates who can articulate the clinical relevance of basic research to health agencies, legislatures, and the public. With their unique skills, many clinician-scientists have been, and will become, leaders in academic ophthalmology and industry.

With increasing numbers of well-trained PhDs, should it matter if the clinician-scientist disappears? According to Rosenberg, the bridge between bench and bedside will weaken, perhaps even collapse, with the absence of the clinician-scientist. Their loss will not only impede the process by which questions inspired by a patient’s condition become a research topic, but it will also impede the flow of disease-relevant information. Surely, it matters!

THE DILEMMA FOR THE CLINICIAN-SCIENTIST

Within the United States, the National Eye Institute, Bethesda, Md, and other public and private organizations support most basic vision research, while industry supports the development of commercial drugs and devices. However, clinician-scientists, who are the vital bridge between research and product development, have no stable source of support. With shrinking reimbursements for clinical services, academic medical centers are...
increasingly, and necessarily, cost oriented. In some cases, the clinician-scientist has been a highly visible target for the medical center director, medical school dean, or ophthalmology department chair who is cutting costs to obtain a balanced budget. Even a successful clinician-scientist with research grants may only have little of his or her salary support from research funding. Previously, clinical revenues from 2 half-days or less of patient care activities could be used to augment research funding. Such support provided the clinician-scientist with the time and freedom to think and teach. With shrinking clinical revenues, however, funding to compensate for the shortfall in the clinician-scientist salary is no longer available or can no longer be provided. As a result, clinician-scientists are asked to spend increasing amounts of time with patient care activities. As the level of clinical reimbursement is reduced, more time is required to be committed by the clinician-scientist to salary support. With more time spent in clinic, the clinician-scientist has less time to conduct research, and consequently, less opportunity to compete successfully for research funding. This creates a difficult dilemma that has several consequences for the clinician-scientist.

To have the time to better compete for research funding, some clinician-scientists forgo patient care and choose to do only vision research. Uncertain of whether they can support themselves through research grants, but not having the time to compete effectively, other clinician-scientists do just the opposite and enter full-time clinical practice. In either case, there are fewer clinician-scientists. This also has consequences for students who might consider pursuing a career as a clinician-scientist. Instead of observing a mentor practicing an academic lifestyle devoted to teaching and research, as noted by Bernard Becker, MD (address to the Association of the University Professors of Ophthalmology, oral communication, March 2000), they witness faculty harried and harassed by the institutional pressure of the bottom line.

ARE THERE FEWER CLINICIAN-SCIENTISTS IN OPHTHALMOLOGY?

There has been no systematic survey of the clinician-scientists involved in vision research; however, there are some data that are available for the larger group of clinician-scientists involved in biomedical research. For more than 20 years, there has been a steady decline in grant awards to physicians, and this also may be the case in ophthalmology. Joseph Goldstein, MD, 1985 Nobel laureate in medicine, has suggested that if the trend continues unabated, there will be no physicians in the National Institutes of Health (NIH) postdoctoral pool by 2006. Even more alarming, he indicated that the number of physicians applying for their first NIH grant has been reduced by almost one third between 1994 and 1997 and that if this trend continued, there would be no new physicians applying for NIH grants after 2003.

Is the clinician-scientist in ophthalmology an endangered species? Although definitive data have not been compiled, it does seem that increasingly fewer ophthalmologists are interested in (or perhaps prepared for) careers as clinician-scientists. In 1999, there was only 1 application for a National Eye Institute clinician-mentored grant (K08) in glaucoma, despite both a high percentage of funding of these awards and an increase in the salary cap (Ellen Liberman, PhD, oral communication, April 14, 2000).

WHAT CAN BE DONE?

Whether the career path of the clinician-scientist in ophthalmology remains viable in the long term is related in large part to the future condition of our health care system. Just as there are no immediate solutions for the current health care disarray, it is not likely that there is an immediate and permanent means for enhancing the viability of the clinician-scientist in ophthalmology. Nevertheless, there do seem to be some actions that might provide some short-term relief and initiate the elucidation of long-term solutions.

First, the current status of the clinician-scientist in ophthalmology should be surveyed, and an ongoing means for compiling relevant data should be delineated. Identification of the clinician-scientists, their academic institutions, means of support, research interests, and training need to be systematically acquired and catalogued. Are there fewer clinician-scientists because their R01 grant applications often are not of sufficiently high quality? Or are there fewer clinician-scientists because of the paucity of proposals submitted by them? Are there subspecialty differences, and are there some subspecialties that do better than others? How do clinician-scientists apportion their time, and how would they like to spend it? Are there models for mentoring and/or collaboration that are more successful than others? Are there differences in success between clinician-scientists with and without a PhD? Are certain departments more successful than others in identifying, supporting, and sustaining the clinician-scientist? What resources for clinician-scientists are available within individual departments, and do some departments have opportunities that have not yet been realized? Such a survey could be undertaken and subsequently disseminated under the auspices of the Association of University Professors in Ophthalmology, the National Eye Institute, and/or private foundations.

Second, funding opportunities for clinician-scientists in ophthalmology need to be improved and publicized. The increasing complexity of science necessitates rigorous research training for a clinician-scientist to be successful. An ophthalmologist who has recently completed a residency may have large medical school loans that preclude them from having several years of poorly compensated postdoctoral training. In addition to the National Eye Institute, public and private foundations, the pharmaceutical industry, and health insurers need to be engaged in a dialogue that provides them with compelling reasons for providing funds to support clinician-scientists in ophthalmology. Foundations should expand training opportunities for clinician-scientists and seek to support them not only early, but to sustain them throughout their careers. Insurers and managed care organizations should support epidemiologic and outcomes research as well as the clinician-scientist who can conduct such studies. Many pharmaceutical companies have demonstrated that they can be excellent partners, providing training, research projects,
and funds. This should be encouraged throughout industry, and the magnitude and scope of their commitment should be increased.

The National Eye Institute should not only continue to support training grants for future clinician-scientists but also should expand their scope. Programs such as KO8 awards support the salaries of young clinician-scientists who are making the transition from trainee to independent investigator. The role and time commitment of a concerned mentor who provides a supportive environment to help ensure a successful transition to independent investigator should be recognized with commensurate salary support. Some debt relief from medical school loans also should be considered for an individual who commits and sustains their commitment as a clinician-scientist. In addition to supporting the young clinician-scientist, the National Eye Institute should also consider supporting the salary of a competitively funded clinician-scientist to alleviate some fiscal and temporal demands of clinical activities. Even though it is both unrealistic and unfair to pay a clinician-scientist more than a PhD scientist for the same research, patient care does stimulate and enhance laboratory research. Therefore, clinical activity somehow should be recognized as an integral component of the research process.

CONCLUSIONS

Admittedly, the viability of the clinician-scientist in ophthalmology continues to be under assault. Are things any better today than they were when this subject was last editorialized? Certainly, the economics of the biomedical infrastructure are worse. However, the potential for curing various eye diseases has never been greater. There is no question that the clinician-scientist has a pivotal position in translating research discoveries into clinical practice and, during the postgenomic era of translational research, will continue to be optimally positioned.5

As a clinician-scientist, I am often asked by medical students, ophthalmology residents, postdoctoral fellows, or younger colleagues for advice about whether it is still feasible to pursue such a career. Curiously, my response is similar to the one offered by Epstein. If one is passionate about his or her chosen area of ophthalmology, with unquenchable scientific curiosity and with an interest in contributing to society through improved care, then there should be no hesitation to pursuing this career path. To optimize the likelihood of success, one should obtain the best possible clinical training, seek rigor and excellence in research training, enlist the guidance of an accomplished and nurturing mentor, and seek involvement in a highly supportive academic community.

Robert N. Weinreb, MD
La Jolla, Calif

REFERENCES

3. Hearing Before the House Appropriations Subcommittee on Labor-HHS-Education, 106th Cong, 1st Sess (1999) (testimony of Joseph L. Goldstein, MD, Paul J. Thomas Professor of Genetics and Chair, Department of Molecular Genetics, University of Texas Southwestern Medical Center).